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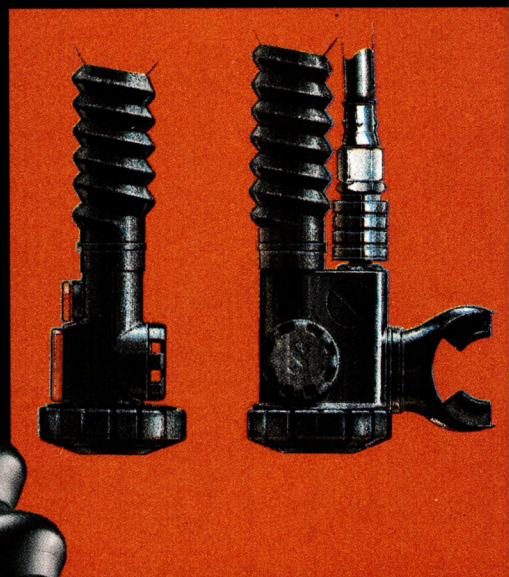
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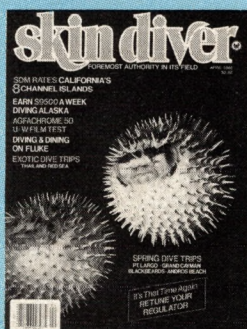
skin diver

Volume Thirty-four Number Four

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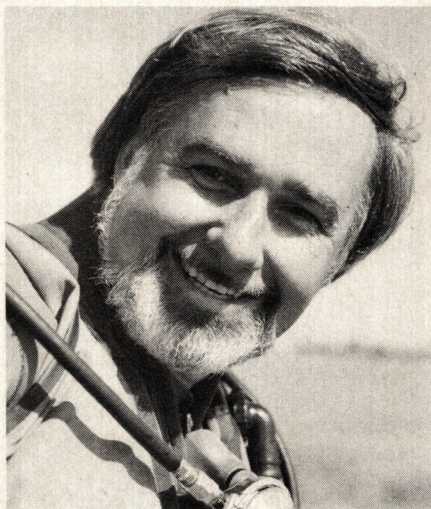
COVER

Porcupinefish can swell up like spiny Christmas tree ornaments when disturbed, making the creature look very unappetizing to potential predators. Found in warm waters worldwide, these fish are just one of many species occurring in the Caribbean areas featured in this issue. Photo/Geri Murphy.

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SDM Editorial

BY THE PUBLISHER



TIME TO RETUNE YOUR REGULATOR

A dive regulator is subjected to a wide variety of corrosive contaminants because of the harsh environment in which it must function. Salt air and saltwater moisture from ocean trips can collect inside and freeze working parts. Carbon dust, chlorinated water, ozone and hard-water mineral deposits can also do damage. The accumulation of these harmful deposits is usually not noticeable because the process is so slow, so gradual.

Even though you have stored it in a cool, dry place, those deadly corrosive contaminants have had their chance to form hard, crusty deposits in the regulator and do more harm than actual use in open water. Much of this damage goes unnoticed because it is happening inside, hidden from the eyes of the owner.

Several leading regulator repair technicians have revealed seven deadly sins against regulator performance:

1) *Hard Breathing* is most commonly caused by saltwater corrosion. Internal moving parts become encrusted with salt crystals and a scale, which causes them to stick or operate sluggishly. Inhalation resistance is often tripled or quadrupled, thus making it extremely difficult or impossible to obtain sufficient airflow at depth during heavy breathing.

2) *Rust Clogging* the sintered filter of the first stage can be caused by the rust or corrosion dust which accumulates inside a scuba tank. Fine rust particles clog the pores of the filter screen and often coat the internal moving parts, causing sluggish or sticky operation.

3) *Carbon Dust Clogging* sometimes results from ultra-fine carbon dust, the by-product of a poorly-operating air compressor. The carbon dust comes from the

charcoal filter on the air compressor. This condition may go unnoticed for quite some time because the buildup is so slow and the dust almost invisible.

4) *Water Leakage* in the regulator mouthpiece is commonly caused by the deterioration of the second stage exhalation valve. The super-thin rubber disc becomes gummed-up from the effects of chlorinated pool water, ozone in the atmosphere or normal aging. Stickiness of operation can cause increased exhalation resistance, intermittent water leakage and finally complete flooding of the second stage.

5) *Free Flowing* can be caused by dirt or dust particles which mar or dent the high pressure valve seat in the first stage. The smallest speck of dirt or rust on this finely-machined surface can cause a steady seepage of high pressure air into the low pressure hose and second stage. The damage is irreversible and the leak tends to get worse with additional use, until air is flowing out of the regulator mouthpiece in an uncontrolled stream.

6) *O-ring Leaks* can result from the buildup of salt corrosion inside the regulator or from a general drying out of the silicone lubricant needed to keep these seals healthy. The slightest crack, tear, nick or split on the surface of an O-ring will break the seal and cause either an intermittent or steady leak of air. Continued use of a faulty O-ring can result in a complete break of that seal and the rapid flow of large amounts of air.

7) *Erratic Flow* of air can be caused by a second stage which is not properly tuned or has parts that are sticking. The intermediate stage pressure may be wrong or the second stage lever improperly set or perhaps the breathing diaphragm is brittle. Internal parts and settings go out of whack as a result of aging, hard use or saltwater exposure.

No amount of washing or careful use can completely prevent your regulator from getting out of tune. Routine maintenance can prolong its good performance, but eventually your regulator will need

service and tuning. The job should be done every six months or once a year, depending on the amount of usage and the kind of exposure your particular unit receives. Generally speaking, a good internal cleaning (ultrasonic or acid dip) by an experienced regulator repair technician will take care of 90 percent of the performance problems. Parts replacement is generally minimal, amounting to a few O-rings and perhaps a valve seat and more flexible breathing diaphragm.

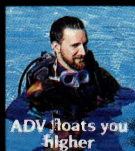
Considering the vital importance of good regulator function, the cost of cleaning and tuning is surprisingly reasonable, usually under \$50, most of which is for technician labor. When you divide this repair charge by the number of months of trouble-free performance you receive, it amounts to a small maintenance charge of three to four dollars per month. It is a small price to pay for the care of a life support device.

Where should you take your regulator for repair? You have several options available. The most obvious is your local professional dive store where you may have originally purchased your regulator or where you regularly obtain air fills. Many pro dive stores maintain a well stocked service center for the equipment they sell and their technicians are sent to dealer repair workshops conducted by the factory. Another option is to send your regulator to one of the large regulator service centers that specialize in the repair of regulators, hydrostatic testing of tanks and servicing of other scuba accessories. Your regulator can be mailed in, serviced and returned in less than two weeks. Still a third option is to send your regulator back to the factory where it can be overhauled by personnel who generally have every conceivable replacement part at their disposal.

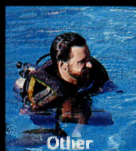
The most important thing to remember about getting your regulator repaired, cleaned or tuned is that it should be done *early* in the season. Don't go in the water if your breathing machine isn't performing perfectly. ➤

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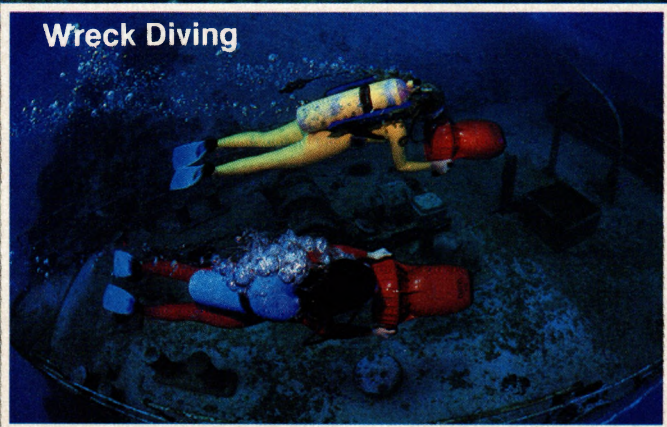
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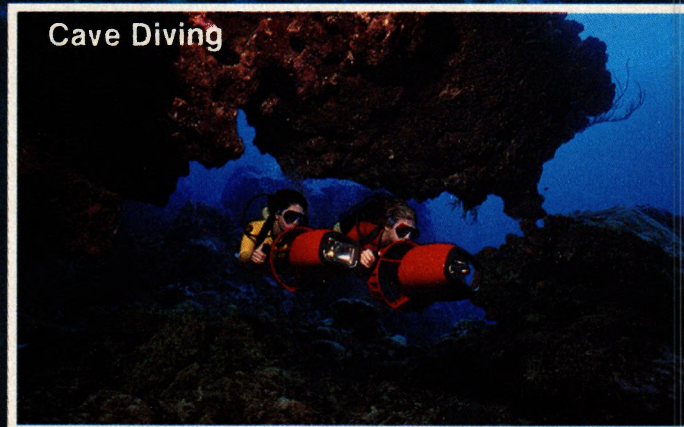
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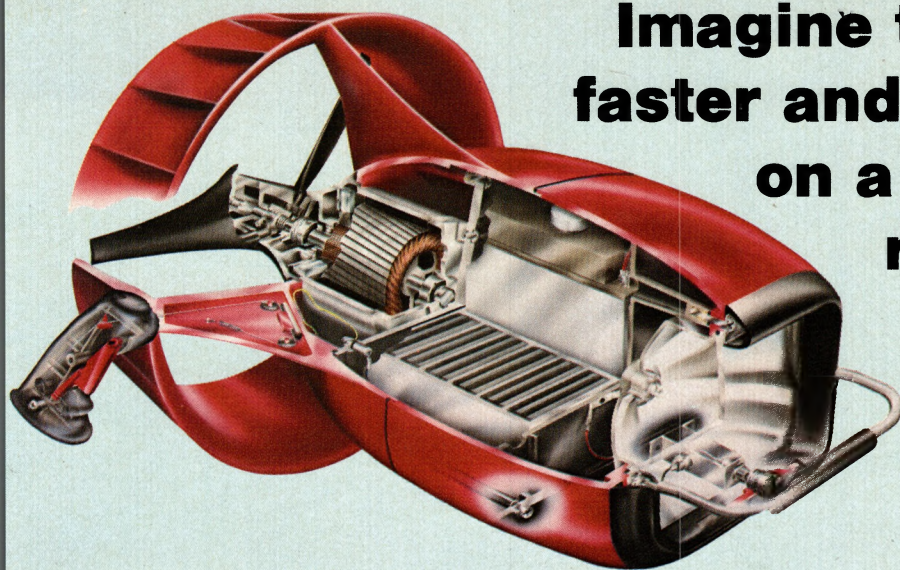


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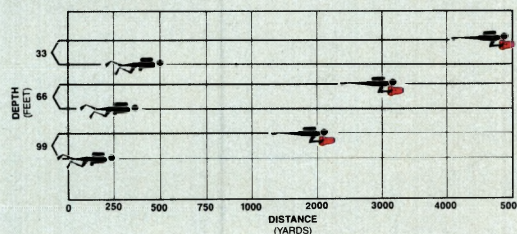
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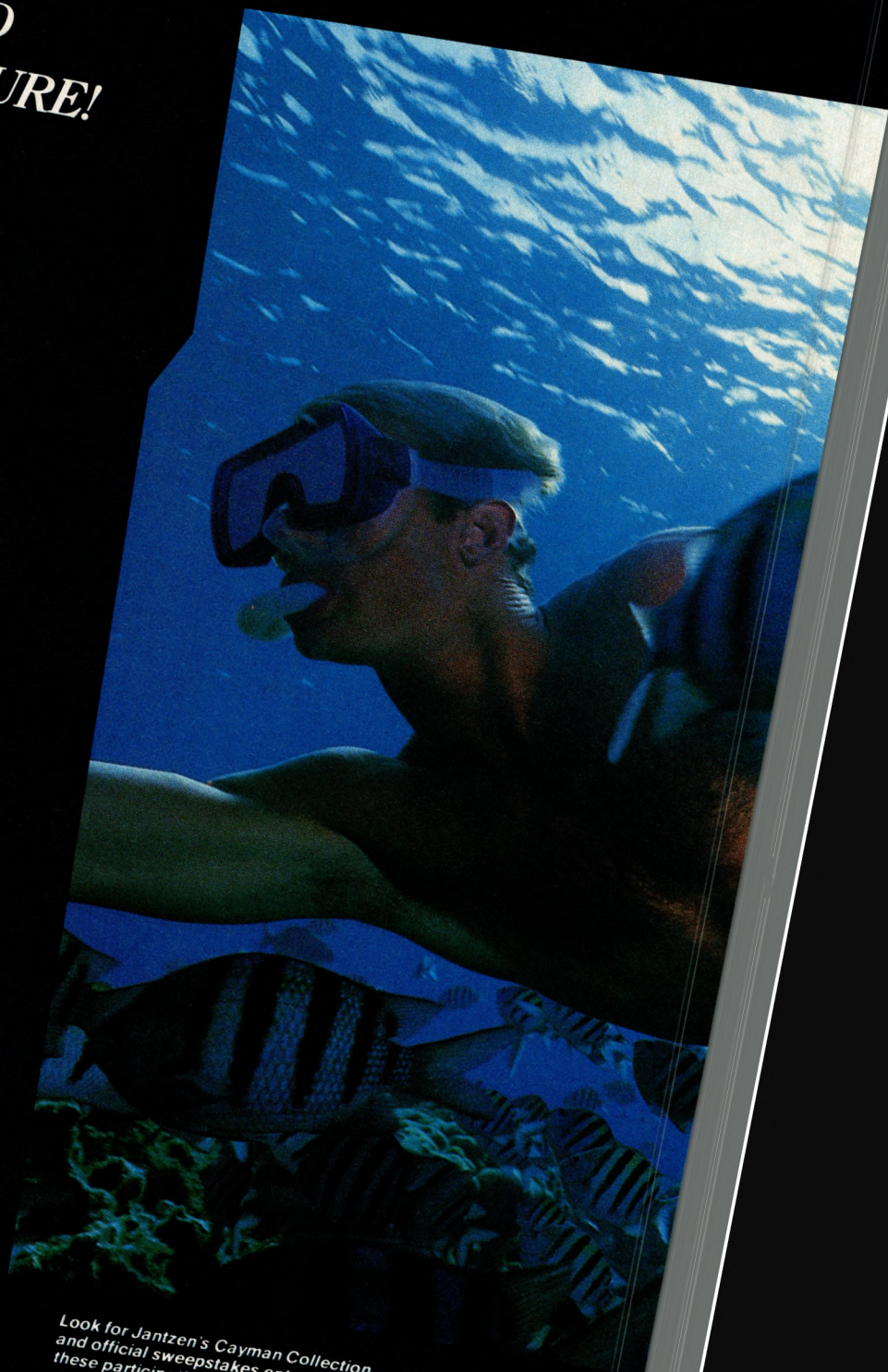
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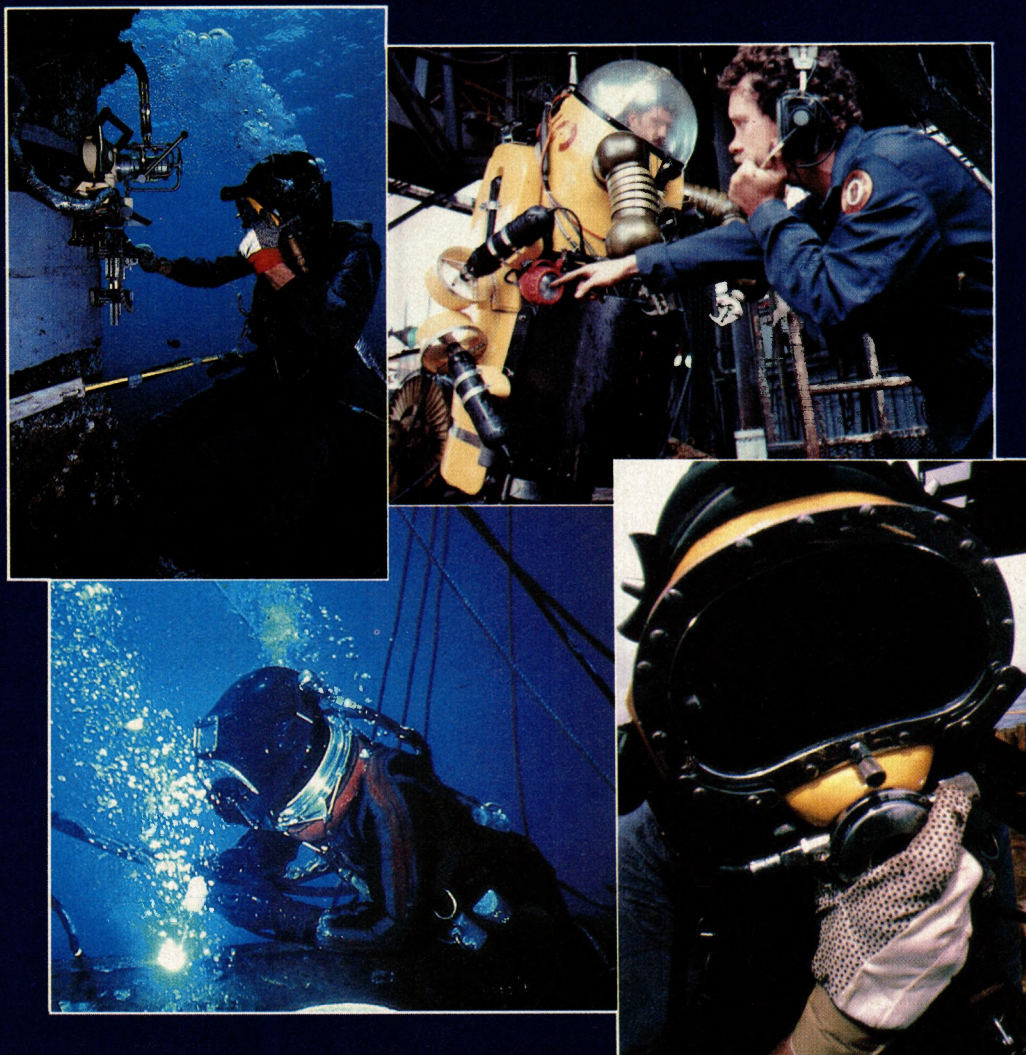
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Scuba Quiz

Disorientation is mentioned frequently in diving literature as a potential problem. Just what is it? What causes it? How can it be avoided? What should you do if you become disoriented? These and other questions are included in the following quiz. See if you can orient yourself to the correct answers, which are on the next page. Note: Select the most correct answer unless otherwise noted.

1. Disorientation in diving is best defined as:

- ☐ A. Loss of one's bearings or perception of relative position
- ☐ B. Hallucination of movement
- ☐ C. Dizziness and light-headedness
- ☐ D. Being lost

2. The means by which one is normally oriented on land are:

- ☐ A. Visual and vestibular (sense of balance in the ears)
- ☐ B. Visual and proprioceptive (effect of gravity on body)
- ☐ C. Vestibular and proprioceptive
- ☐ D. All of the above

3. The *primary* means by which one is usually oriented underwater is by:

- ☐ A. Proprioceptors
- ☐ B. Vestibular function
- ☐ C. Visual clues
- ☐ D. Instruments

4. The most dramatic cause of disorientation underwater is:

- ☐ A. Vertigo
- ☐ B. Turbid water
- ☐ C. Absence of light
- ☐ D. Weightlessness

5. Which of the following is likely to contribute to disorientation while diving? (Select all correct answers.)

- ☐ A. Inexperience
- ☐ B. Unequal pressures or temperatures in middle ear spaces
- ☐ C. Dirty, surgy water
- ☐ D. Clear water with no visual reference
- ☐ E. Absence of light (as at night)
- ☐ F. None of the above

6. Which of the following will help prevent disorientation while diving:

- ☐ A. Visual references
- ☐ B. Diving experience
- ☐ C. Recognizing sensations which provide orientation clues
- ☐ D. Keeping your buddy in sight
- ☐ E. All of the above

7. List at least three means available to every diver to determine orientation in dark or turbid water.

- ☐ A. _____
- ☐ B. _____
- ☐ C. _____

8. Disorientation is most likely to occur during _____ descents and least likely to occur during _____ ascents.

- ☐ A. Head-first, head-first
- ☐ B. Head-first, feet-first
- ☐ C. Feet-first, head-first
- ☐ D. Feet-first, feet-first

9. Which of the following is *not* likely to contribute to disorientation while diving:

- ☐ A. Nitrogen narcosis
- ☐ B. Forceful ear clearing
- ☐ C. Decompression sickness
- ☐ D. Excessive ear wax
- ☐ E. All of the above are contributors

10. If while diving in very limited visibility you become disoriented between the surface and the bottom, which action is recommended after regaining orientation?

- ☐ A. Surface and abort the dive
- ☐ B. Swim quickly to the bottom
- ☐ C. Surface, obtain a descent line and continue dive
- ☐ D. Surface, abort dive and seek medical assistance

Scuba Quiz

Answers: Disorientation

1. A. Loss of one's bearings or perception of relative position. Disorientation is more serious than just being lost. It means you don't know where you are in relation to the surface, the bottom or anything. You literally cannot distinguish up from down. It is a frightening feeling that must be avoided or quickly overcome.

2. D. All of the above. Visual input is the primary means, followed by the sense of balance in the ears. Proprioceptors in the body feel the effects of shifted weight in muscles and also help maintain balance. Combined, these keep us quite stable on land.

3. B. Vestibular function. When you can see well and there are visual references, sight can prevent disorientation. However, owing to low light levels, limited visibility and lack of references, your primary means of orientation underwater is the sense of balance in your ears. Proprioceptors are largely ineffective owing to weightlessness.

4. A. Vertigo. Since your primary means of orientation while diving is vestibular and since disturbance of your sense of balance in your ears results in vertigo, you can instantly become disoriented if the world starts spinning about you. Vertigo must be prevented to avoid disorientation.

5. A through E are all correct. Anything—even excessive ear wax—which prevents the middle ear spaces from maintaining the same temperatures and pressures—can be a problem. Not being able to reference objects underwater—whether the water is dirty or clear—is also a contributor. When near the bottom in dirty, surgy water, hallucination of movement can cause confusion. There is less tendency to become disoriented as experience increases.

6. E. All of the above. Experience and visual references, even your dive buddy, are helpful; but you should be able to identify various sensations which provide clues to your orientation in the water. An example is the effect of changing pressure on air spaces. Other examples are listed in the next answer.

7. Direction of gravitational pull on weights; angle of water inside mask; direction of exhaust bubbles; shift of air in buoyancy compensator or drysuit; direction of movement with increased buoyancy.

8. A. Head-first, head-first. In a 30 degree head-down position during descent, the semicircular canal in the ear providing the horizontal axis information is vertical—its least effective position. This position can produce the most intense vertigo. In a 60 degree head-up position, the horizontal canal in the ear is horizontal—its most effective position. This information suggests that feet-first descents are preferred and that diving head-down with positive buoyancy can lead to difficulty.

9. E. All of the above are contributors. Essentially anything which can affect your vestibular function can cause vertigo, which results in serious disorientation. Narcosis, decompression sickness, high partial pressures of gases and even shallow breathing during ascents can lead to disorientation, but these causes are not commonly experienced by recreational divers.

10. C is correct, but A is an acceptable response. If you really need or want to dive in such conditions and you have sufficient training and experience to do so, you can resume the dive provided you use a descent line for a reference until the bottom can be seen. Medical attention is recommended only if the disorientation is prolonged or is a frequent occurrence.

Disorientation is a nuisance with which more divers should be familiar. The worse the diving conditions, the greater the chances for disorientation owing to sensory deprivation. I hope you have increased your understanding of the subject and will be able to avoid it or overcome it. It helps if you know what's up in diving!



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Wreck Facts



BY ELLSWORTH BOYD

Many divers are writing and asking about the German cruiser, *Prinz Eugen*, wrecked on Kwajalein Atoll, Marshall Islands. In September 1984, Technifacts writer E.R. Cross expressed concern about diving on the wreck because it had been used in atomic bomb tests 42 years ago. John F. Millican Jr., Chief of the Range Safety Office, Kwajalein Missile Range, writes: "Divers at Kwajalein dive on the *Prinz Eugen*. Dives are primarily of a sightseeing nature since penetration is not allowed owing to large quantities of oil within the ship. No excursions are allowed that will cause a disturbance such as opening hatches, hammering on the hull or tampering with external fixtures. Although the *Prinz Eugen* took part in atomic tests at Bikini Atoll in 1946 prior to being towed to Kwajalein, there is no radiation hazard to divers from the vessel." The chief's address is: Department of the Army, Headquarters Kwajalein Missile Range, Box 2526, APO San Francisco, CA 96555. Divers who want historical data on the *Prinz Eugen* should consult: *Dictionary of American Naval Fighting Ships*, Volume V., 1970, page 388.

A very interesting letter arrived from Ralph T. Briggs, Las Vegas, Nevada. Ralph is researching and writing a book about his family's history. Part of it will include a personal account of his dramatic encounter with a coded message that almost exposed the Japanese attack on Pearl Harbor. Ralph writes: "I am the former naval officer who intercepted the much discussed 'Winds Code Execute' message on December 4, 1941 which

was a tip-off of Japanese intentions to strike the United States." Ralph retired in 1978 after 44 years in Naval Intelligence. Pearl Harbor and World War II researchers may contact Ralph at: 5224 S. Annie Oakley Drive, Las Vegas NV 89120.

Bruce and Bob Lanham, Pleasant Hill, California, have explored over 40 wrecks in the northern waters of the Golden State. Nicknamed "the Golden Ones," the brothers are employed in underwater and topside construction when they're not salvaging "poor man's gold"—brass portholes. Some of their favorite Northern California wrecks are: the steamship *Whittier*, steam schooner *Winnebago*, and the steel steamer, *Noyo*—all sunk off Pt. Arena; the steam schooner *Ventura*, sunk off Pt. Sur; the wooden steamer *Flavel*, down off Pt. Cypress; and the steamship *Lewis*, sunk in Bolinas Bay. "We only got a handful of good days on our favorite wrecks," Bob says, "with 15 to 20 foot visibility and winds that were bearable. Drysuits protected us from 50°F waters. When vacation time arrived we had the good sense to head south to the Caribbean for warmer, calmer seas. But we still dive California wrecks when 'brass fever' sets in!"

Mary Lou Petti, Mansfield, Maine dove the *Antilla*, sunk off Aruba, Dutch West Indies and wants to know more about it. The brand, spanking new 400 foot German freighter was scuttled by her captain in 1940 when Dutch marines surrounded it. But the captain ordered the crew to set fire to the ship and open the seacocks before abandoning her. The Dutch couldn't extinguish the fire and towed the ship to the northeast coast where she

sank in 50 feet. A popular dive site, the *Antilla* is 398 feet long, 4,363 gross tonnage, formerly owned by the Hamburg American Line.

Mary Lou also asks about the *Peder-nales*, sunk off Aruba. John Scalia, Jr., Hammonont, New Jersey, who dove this vessel, supplies the following: "The *Peder-nales* is an American oil tanker torpedoed in February 1942 off Aruba's south coast. Her stern section was towed to the northeast coast where the Dutch used it for target practice. The wreck is about one mile south of the *Antilla* and one mile offshore. I have some slides of the *Peder-nales* if anyone is interested."

Bob McKay wants information on a ship nicknamed, "The Brick Wreck," off Long Reef, north of Pacific Lighthouse, Miami, Florida. My man in Miami—Jerry Aspinwall—has moved, Bob and left no forwarding address. Jerry used to dive that wreck. Perhaps one of our readers can help you. If you know anything about the history of this wreck, write to Bob McKay, 861 E. 11th Place, Hialeah, Florida 33010.

On a similar note, does anybody have information on wrecks off Guam, largest of the Marianas Islands? I've received several requests, but can't locate any books specifically designating these wrecks. Thanks for your input.

Andre Nahr reports from Bonaire that the sinking of the 236 foot long drug smuggling freighter from Columbia, the *Hilma Hooker*, was lots of fun for local dive teams. The *Hooker*, alias *Doric Express*, *Anna C.*, *Mistrial* and *Midsland* was owned by an import-export company in Columbia. She limped into Kralendijk Harbor, Bonaire, with engine trouble and was reported to have 25 tons of marijuana carefully concealed between her bulkheads and decks. Netherland Antilles authorities verified the report and confiscated the cargo. The ship began to leak where parts were cut away to reveal the drugs. That's when an all night vigil by local divers began in order to position the freighter as an appropriate dive site.

She went down at 9:00 am in a narrow sand channel between two reefs not far from shore in the Alice-in-Wonderland area. Captain Don Stewart, dean of divers in Bonaire, led the first official boat trip to the *Hooker* five hours after she was scuttled. Lying on her starboard side, the wreck is 90 feet deep. It's 50 feet to her port rail. Nahr says a video tape is available for divers who want to view the dramatic descent of Bonaire's new dive site, accessible by land or sea.

Ft. Lauderdale divers are delighted with a paperback book, *Shipwrecks of Broward County*, by Steve Singer and James Dean. The authors cover 40 wrecks from Deerfield Beach to Hallandale, including galleons from the 1500s to World War II casualties. Singer and Dean did a thorough job in researching

(Continued on Page 39)



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Technifacts

BY E.R. CROSS



Last month Technifacts discussed the impact rivers and dams had on the people who lived and played in an environment dominated by the still waters of dams. In particular, we talked about how this combination of river and dam affected sport divers. We stated that commercial divers play a critical part in the construction and maintenance of dams. Technifacts this month will detail some of the skills and equipment required to make and keep a dam a viable reality. David Darlow of Allied Commercial Divers, Spokane, Washington, will share with SKIN DIVER readers some of the techniques and excitement of his work on dams in Washington, Idaho and Montana.

Historically, there have been dams constructed across streams for one or more reasons since at least 4,000 years

ago. The earliest earth fill dams were apparently constructed by Egyptian engineers to divert flood waters of the Nile River into historic Lake Moeris (probably what is now known as El Faiyum Depression about 50 miles southwest of Cairo). Evidence uncovered in Arizona indicates Indian inhabitants of the Gila and Lower Salt River basins constructed an extensive system of small dams to provide irrigation for their otherwise arid land. Today some of the world's great modern dams, some of which I have worked on (Roosevelt, Horse Mesa and Bartlett), are in this same area and provide nearly the same service for modern resident farmers.

To be effective, a dam must primarily provide an impervious barrier across a stream channel with its principle function being to raise the water level of the

stream bed for one or more reasons. An essential requirement of any dam is that it be both stable and permanent. Most fall into one of five broad classifications; earth fill, rock fill, gravity, arch and buttress. Further classification can be made depending on the material used in the construction and the use to which the dam is put after completion.

All dams control the flow of water in a river to some extent. In accomplishing this certain benefits are accrued. These include flood control in problem areas; the reduction of pollution and improvement of water quality; slack water navigation; water for municipal and industrial users; electrical power; reduction of sedimentation and erosion; irrigation; enhancement of environmental quality; rec-

(Continued on Page 120)



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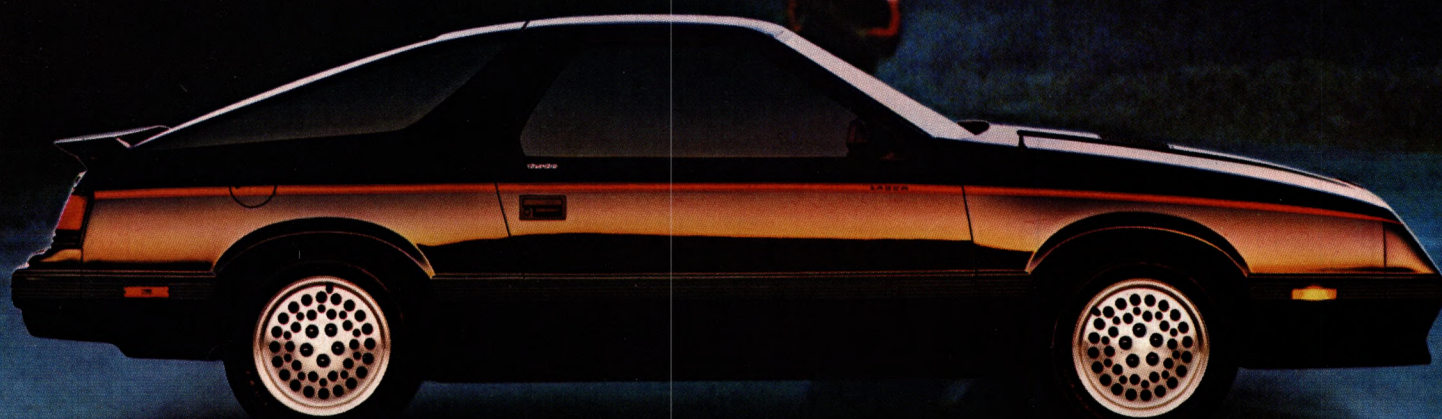
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ALASKA'S WHITE GOLD

TEXT AND PHOTOGRAPHY BY ERIC MORRIS

Coated with a layer of snow, Jack and I roused ourselves from our exhausted stupors and adjusted the straps to our full face hookah masks. Our weather-beaten diving skiff heeled over slightly as another flurry of snowflakes blew across the water. The compressor engine coughed, caught and finally roared to life as David, our topside tender, pulled on the recoil starter. Dull red hookah hose, 100 feet for each diver, was uncoiled and dropped over the side. I sat on one gunnel, Jack on the other and we both sucked hard for each breath of air until the compressor built up a higher pressure. I pushed the intake valve on my chest and a burst of cold air flowed into my drysuit. A tired nod at each other and we rolled out of the boat and into an inch of snow slush on top of the saltwater.

Our 60 pound weightbelts rapidly took us to the bottom, a scant 15 feet beneath the skiff. Visibility was poor, just a yard, but it was sufficient to see broad leaves of kelp layered across the bottom. Each was heavily covered with thousands of tiny white herring eggs. Our job was to harvest the egg-saturated leaves.

We stuffed loose kelp into our large mesh bag, always working upcurrent to avoid the silt cloud our collecting stirred up. Many of the kelp plants were still attached to rocks and had to be cut loose. As the bag filled, it became bulky and was difficult to pull through the water.

Occasionally a small flounder or sculpin darted away, giving us a momentary scare, until we realized it was harmless. Our concern over fast moving sea creatures was not unfounded—large wolf eels hid under the kelp and were sometimes grabbed up along with an armful of leaves. Though capable of giving a nasty bite, they had merely departed, leaving behind startled but thankful divers.

Once our bags were full, we inflated our suits and allowed the inrushing air to lift us to the surface. After getting our

bearings we swam back to the skiff, towing our bulging bags. While David winched the kelp into the boat for sorting and cleaning, we departed with new bags, scouring the bottom for more herring eggs and kelp. Sometimes we could fill a bag in minutes, other times we might spend a half hour and find nothing.

David's job as the diving tender was, in many ways, more demanding than our diving. Exposed to the elements, he had to manage the boat and keep a constant eye on the air compressor and hookah hoses. In addition, he had to pull the kelp into the skiff and clean it, throwing out such diverse items as starfish, crabs, rocks and even flounders. The inspected kelp was packed in large wooden boxes which, in turn, had to be carefully stowed so as not to capsize the boat.

From dawn to dusk we pushed, pulled and swam our kelp bags between the shallow bottom and our high-sided skiff. Even our short breaks for hot coffee and cold sandwiches offered little respite. Owing to the almost constant sleet or snow, our suits often froze stiff. It was far colder in our open boat than under it!

When it became too dark to dive we gratefully motored our skiff to the nearest buyer boat and tied up alongside. While we gulped down steaming cups of hot chocolate, our kelp was unloaded, weighed and inspected for quality. Later, as we sped home to our camp, our tired and cold bodies were warmed by the realization of the generous paychecks we had all received. Our six days of diving netted us \$9,500 apiece. To celebrate we spent the next day in our sleeping bags!

Kelp harvesting takes place every year in the Prince William Sound area of Alaska. During April huge schools of ocean herring enter the sound and lay millions of small white eggs over rocks, kelp and eelgrass. The eggs are laid in such an immense quantity as to coat the entire bottom of large coves and bays. Everything

is buried beneath the tiny eggs, giving the appearance of a submarine snowfall.

Herring roe on kelp is quite edible and considered a real delicacy to the people of Japan who import most of the harvested product. The roe-covered kelp most popular for eating is called ribbon kelp. Similar to the well-known bull kelp, ribbon is much softer and smaller. The kelp is usually eaten raw as an hors d'oeuvre. Sometimes a scoop of rice is rolled up inside—sort of a Japanese burrito!

Although the major seafood processors will pay American divers 50¢ to \$1.50 per pound for kelp with good egg coverage, by the time the product reaches Japan the consumer price has escalated to \$12 per pound. The increase is owing to high shrinkage from sorting and the long shipping distance.

Currently the only legal way to harvest kelp is by diving. Grappling from the surface with large rakes, at one time legal, is now prohibited by the Alaska Department of Fish and Game owing to environmental damage of the kelp beds. All divers engaged in kelping must have a State of Alaska commercial fishing license and also a special kelping permit. Using their own divers, the Department of Fish and Game monitors the kelping season.

The actual diving locations are centered around an abandoned mining and fishing town named Ellamar. It is found about midway between the seaports of Cordova and Valdez, tucked into the base of an impressive mountain. Built during the middle 1800s, Ellamar was at one time a booming gold mining town, at another time a silver mining town. It finally faded into obscurity when the main mine shafts flooded in the early 1900s. Several of the old houses and other buildings are still standing. Huge, rusting steam engines, mining carts and other machinery litter the beach adjacent to an old ore dock. Today, Ellamar serves both as a base camp for many of the kelp divers

Divers Earn \$9500 A Week Harvesting Herring Roe



and as a secure anchorage for the kelp buyers and their large processing boats.

The most successful divers utilize large open fishing skiffs in the 20 foot range. These are generally powered by small outboard motors since speed is not necessary and fuel is difficult to get. Good anchors are required as the wind can become very gusty. A plumbing pipe davit with a hand cranked winch is also needed for hoisting the heavy bags of kelp out of the water. Although a few divers use scuba, most seem to prefer small hookah units which deliver air to the divers through 100 foot long, floating hoses. With a diver spending 10 to 14 hours a day in the water, a drysuit is mandatory. Despite the long hours submerged, kelp divers seldom venture below 25 feet, so the bends are highly unlikely.

The kelping season is notoriously short, seldom lasting more than one week, necessitating maximum time in the water to be successful. Most diving days start at 4:00 am and end only when darkness forces a halt to work, usually around 8:00 or 9:00 at night. But, by the time the last load of kelp is sold, the boat secured for the night and dinner eaten, it is often midnight. Kelp diving is literally a "burn-out" and only those people in superior shape stand to make much money.

Despite difficult living conditions and the brutal diving schedule, we find ourselves back in Ellamar year after year. We get to breathe fresh wilderness air, enjoy the snowcapped mountains and view some beautiful wildlife. And, we've always found a little "white gold." ❧



Top: The author (left) and Greg York with "white gold"—kelp covered with herring roe. **Above:** Mark Reiss empties his kelp bag. **Right:** Seaplanes provide the main link for supplies to roe harvesters who camp out near an abandoned mining town in the Alaska wilderness. The kelping season seldom lasts more than one week.



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CARP SHOOT OUT At Camanche, California

Diver's Aid D.F.G. Eliminate Ecological Imbalance

BY ALAN AUSTIN

Once a year, a determined group of divers gather on the shores of Lake Camanche, California (30 miles south-east of Sacramento) for a rather unique event: the annual Dolphin Divers of Sacramento and Lake Camanche Northshore Resort Carp Shoot and Navigation Contest. The purpose of the shoot is to significantly decrease the carp population in the lake. Carp are an imported fish, originating in Eastern Asia and introduced to California in 1872. In addition to being very prolific, carp feed on underwater vegetation and the eggs of other fish, thereby creating an ecological imbalance. Dolphin Divers obtains clearance from the California State Department of Fish and Game to use spearguns for the competition; to my knowledge, this is the only California freshwater contest where this is allowed. Each competitor must have a valid fishing license and Fish and

Game Regs, as well as contest safety rules, are strictly enforced.

The shoot starts on a Saturday morning in mid-May (this year it's May 18), at 7:00 am. This is the check-in time for all teams. Each buddy team member must have his/her speargun checked, along with C-card (if scuba is being used) and fishing license. At 8:15 am the general briefing gets underway. It covers any special rules, as well as outlining the area of the contest, scoring and finish time (normally set for 3:30 pm).

When the whistle blows at 9:00 am, the starting line erupts; boats of all types zoom out of the cove into the lake, each heading for a favorite spot, followed (in a landlocked sense) by a fleet of cars and trucks. The preferred places for successful carp hunting are in quiet, secluded shallows and in the "fingers" running inland. Upon reaching a likely spot, the

buddy teams get down to business. Expert teams usually skin dive, keeping noise and splashing to a minimum.

By 3:30 pm all the teams have returned and the fish are weighed in. Prizes are given to the teams taking the most fish and to the person with the single largest fish. Team prizes are duplicated, so each member receives one. These are given down to 20th place or lower. Awards in the past have included tanks, regulators, dive timers, pneumatic spearguns, etc.

The navigation contest, held the following day, is fun for both contestants and observers. Each team tows a float, so people on shore can watch them miss the markers and head for the deep water. Since the course is laid out in only 20 feet of water and covers a short distance, newly certified divers have as good a chance as old hands. Again, as in the carp shoot, contestants enter as a team; prizes are duplicated.

Lake Camanche Northshore's facilities go a long way toward making this an enjoyable experience. In addition to a boat ramp, there are hot showers and one-half price camping to contestants.

Anyone interested in further information should contact Alan Austin (916) 481-6612; or write to Dolphin Divers of Sacramento, 1731 Howe Avenue # 162, P.O. Box 254480, Sacramento, California 95825.

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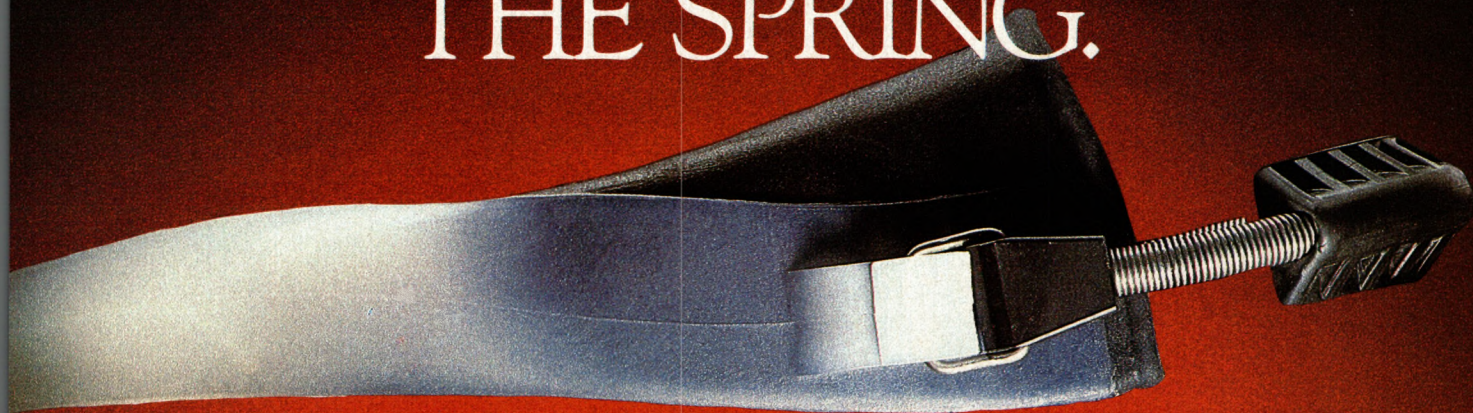
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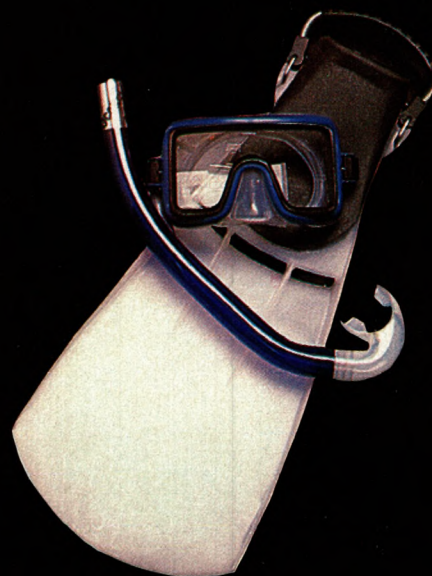
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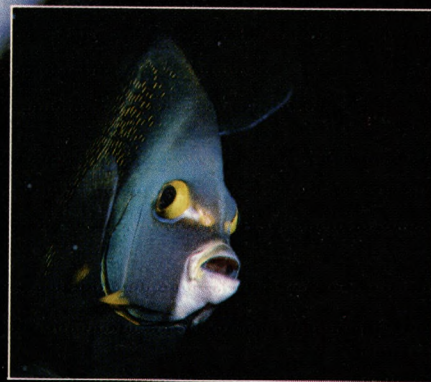
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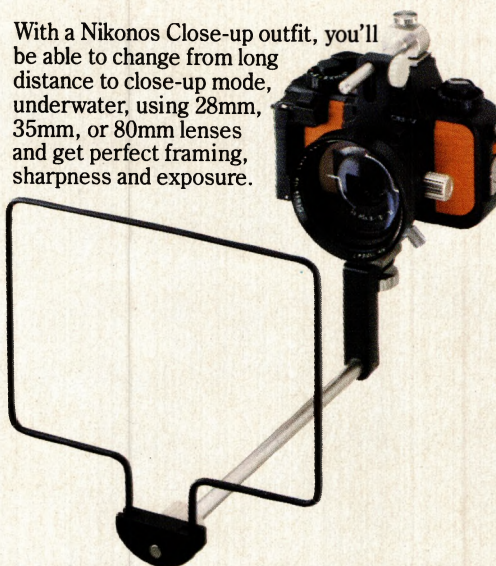
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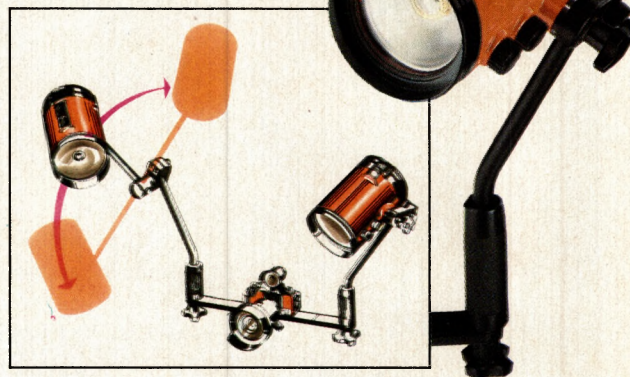
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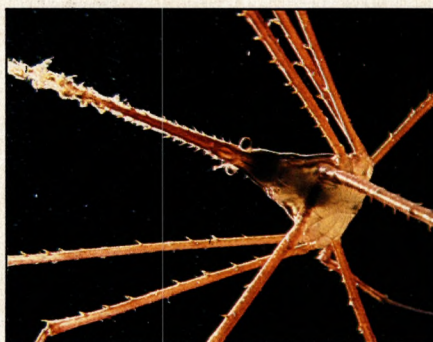
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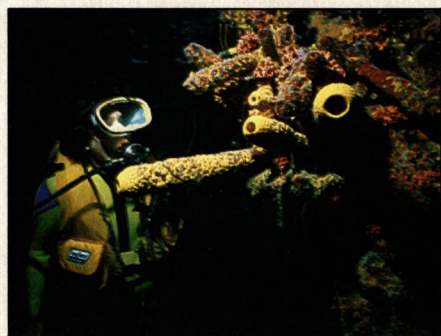
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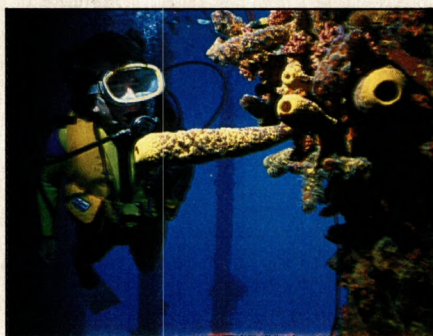
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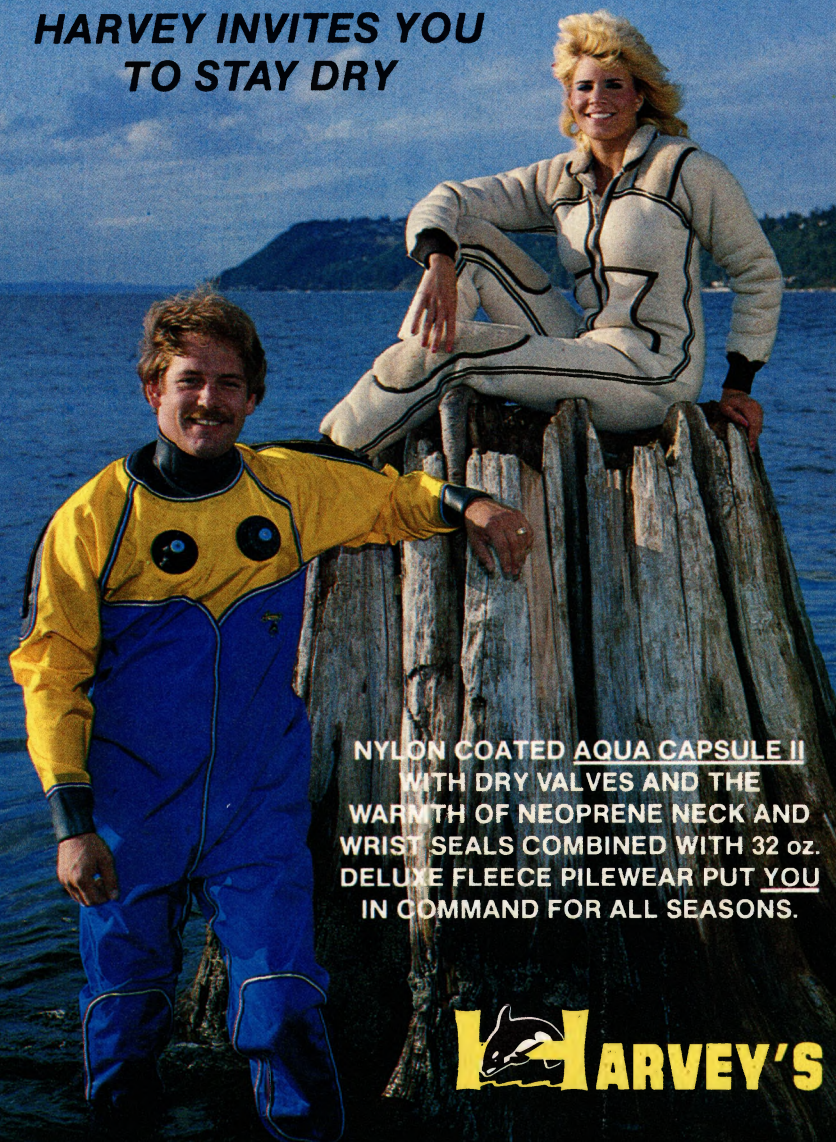
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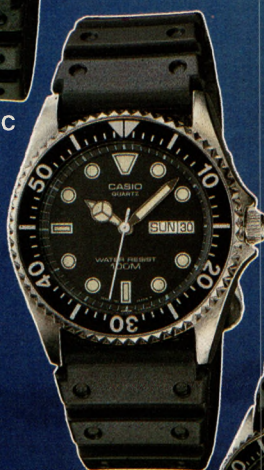
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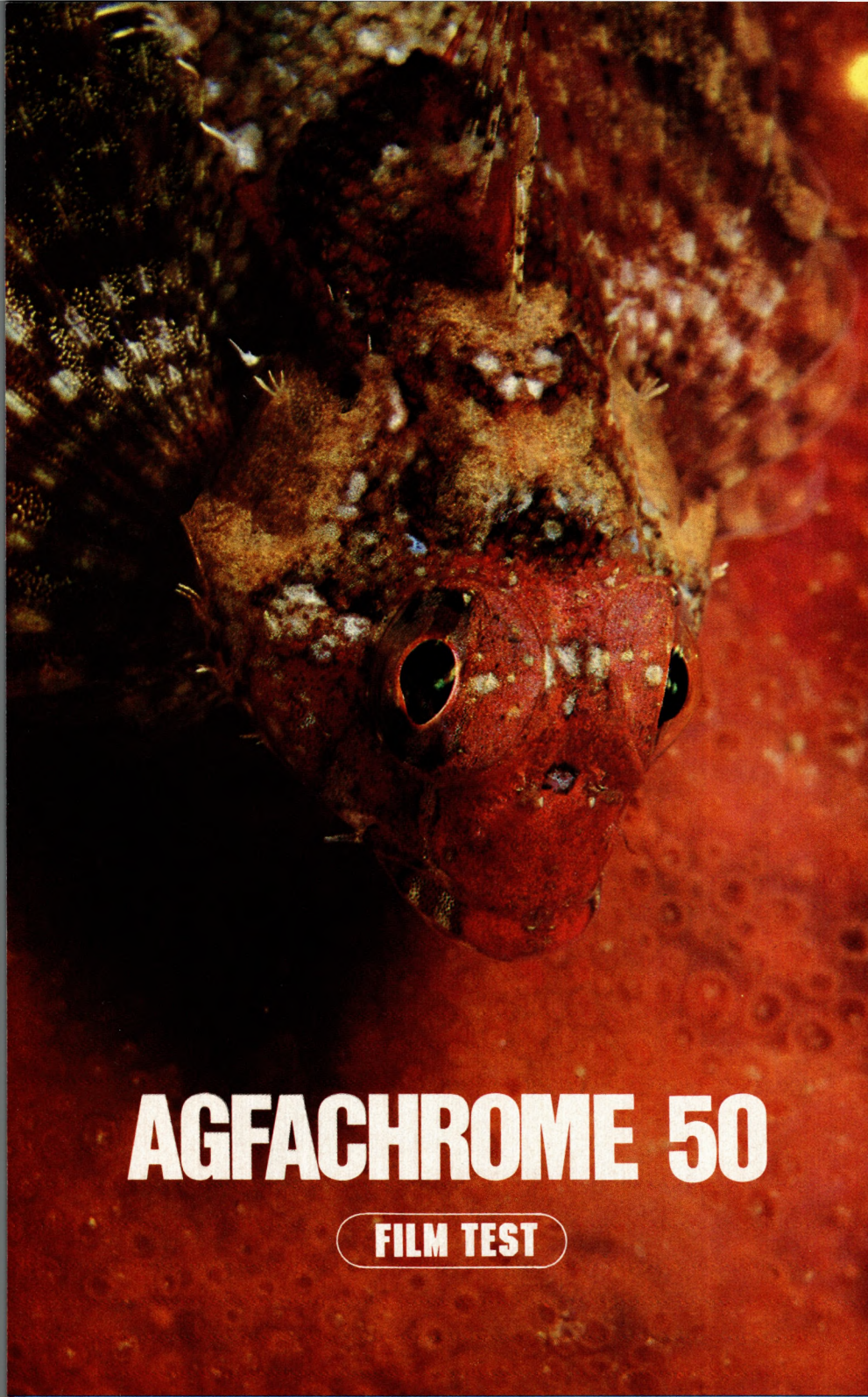


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AGFACHROME 50

FILM TEST

TEXT AND PHOTOGRAPHY BY JIM AND CATHY CHURCH

Agfachrome 50 (which replaces Agfachrome 64) is one of a new family of professional color slide films: Agfachrome 50, 100 and 200. Each of these has new, two layer emulsions based on twin crystal technology for maximum sharpness and minimum grain. Screening dyes reduce light scatter within the emulsion, a red mask over the cyan layer improves greens and an ultra-violet filter layer eliminates any bluish cast. The new

emulsion also has a control layer that prevents build-up of particular colors. Unlike some other films that may have a red, yellow or blue bias, Agfa-Gevaert's goal is balanced, pure color reproduction—the natural look.

In comparing slides taken on Agfachrome 50, 100 and 200, we noticed that the color bias doesn't seem to change with the different ISO emulsions. With other films we've used, however, the differ-

ent speeds definitely had a different color bias. Thus, Agfa-Gevaert's control layer appears to be effective.

Agfachrome 50 (and its sisters) has the designation CT or RS on the film carton, the enclosed instruction sheet and on the cassette itself. Don't be confused: Agfachrome CT 50 and Agfachrome RS 50 are identical. CT means processing and mounting are included with the price of the film. A mailer comes in the package. RS means the film is sold without processing or mounting. Note: The film need not be returned in the processing mailer—any envelope or package will do. It is the CT designation on the side of the canister that determines whether or not Agfa-Gevaert will process.

Because Agfachrome 50 is E-6 compatible, you can have it processed almost anywhere. When dive resorts and dive boats offer color processing, it is almost always E-6. Although we didn't test this feature, Agfachrome 50 can also be exposed and push processed for ISO 100 if a higher film speed is needed.

The word professional on the film carton means that the film has been released at the peak of its optimum color balance and that refrigerated storage is usually necessary to prevent color and film speed shifts. However, the Agfachrome 50 instruction sheet stated that the film should be stored in a cool, dry place and that exposed film should be processed as soon as possible. If the film is to be used in the tropics, the instructions referred us to Agfa-Gevaert's free tropical leaflet which we obtained from their New Jersey office.

The leaflet indicated that an average climate—68°F and 50 to 60 percent hu-



midity—was standard for storing photographic materials, providing no other directions were given by the manufacturer. And, as a general rule, expiration dates were based on this average climate. In tropical climates, however, higher temperatures and humidities accelerate the aging process. Therefore, Agfa-Gevaert recommends storage in an air-conditioned room or refrigerator. The warm-up time for film taken from the re-

frigerator is two to three hours. If you are on an extended trip in a hot, humid climate and without air-conditioning, refrigeration or processing, the leaflet suggests placing the film in its original packing inside a plastic bag and burying the bag in the ground at a depth of about one foot. The film can be stored this way for several weeks because the earth is cool and insulates the film.

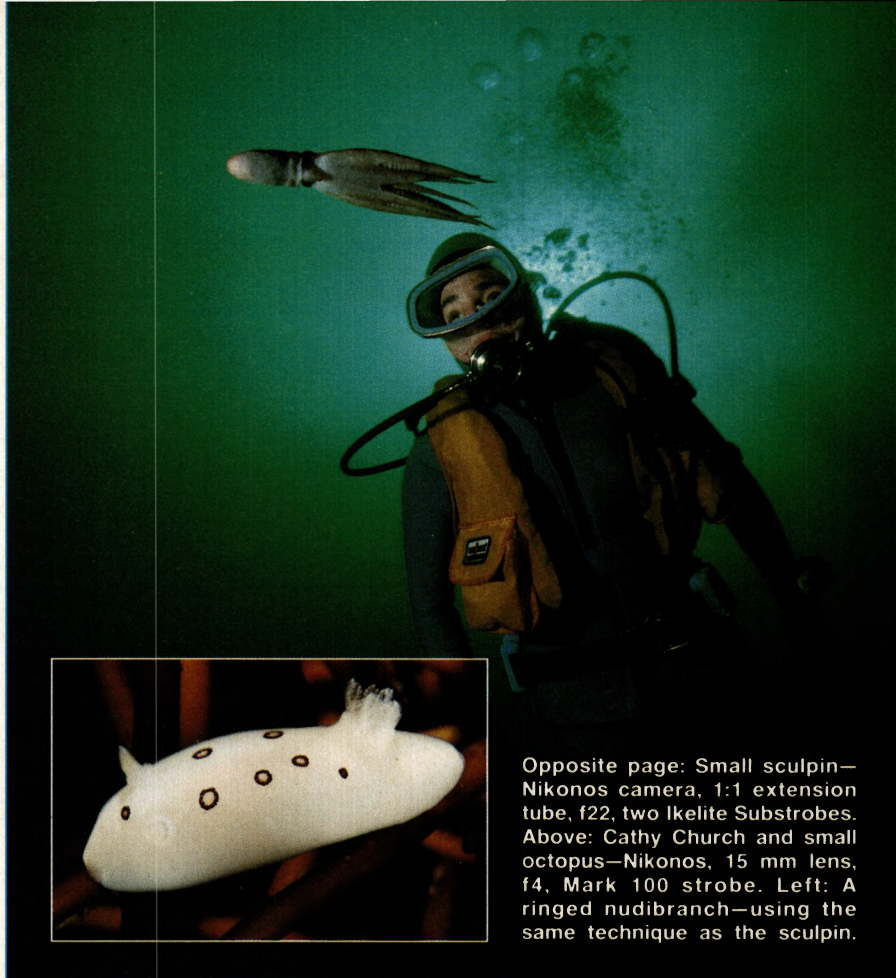
Once the camera has been loaded in a tropical climate with humidity over 80 percent, Agfa-Gevaert recommends finishing the roll in one or two days. In subtropical climates, with humidity between 50 and 80 percent and desert areas with humidity between 30 and 40 percent, the film can be left in the camera for six or seven days. For storage, place cassettes of exposed film and some silica gel packets inside a sealed plastic bag and place the bag inside a refrigerator or air-conditioned room.

Having returned from several months' diving in the warm Caribbean, we tested Agfachrome 50 during our first two dives in the darker, colder water of Monterey Bay, California—a real shock to our systems. Armed with a Nikonos V and 15 mm lens, Jim began with some upward silhouettes. He was at 55 feet with horizontal visibility of about 25 feet. Upward camera angles produced meter readings from f2.8 to 5.6 at 1/90 second. Level camera angles couldn't gather enough light for sunlight exposures, but he could make pleasing exposures with a strobe.

Cathy went after a small octopus, some fish, a starfish and an anemone with her housed Nikon and 55 mm Micro-Nikkor lens. Depending on the angles of her main strobe and Jim's hand-held slave and subject reflectivity, her exposures varied from f16 to 22. For the really small stuff, such as nudibranchs, tiny sculpin and octopus eyes, she used her Nikonos and 1:1 extension tube.

We processed the film at home with standard Kodak E-6 chemicals and inspected the results. The sharpness of fine details was excellent—especially in those slides taken with the housed Nikon. The colors were realistic, not gaudy. While some films accentuate reds, yellows or greens, Agfachrome 50 isn't biased toward any particular color. If this is good or bad, of course, depends on what kind of colors you wish to see in your pictures. Agfachrome 50 didn't seem to have quite as much contrast as other films we've used. A white nudibranch photographed on a dark blue sponge background, for example, didn't burn out, nor did we lose the blue.

Jim lost sharpness in many of his upward silhouettes with sunlight because of limited depth of field and slow automatic shutter speeds in the dim conditions. Agfachrome 100 or 200 would have been a better choice for his long shots. In his strobe exposures, taken at three apparent feet and less, Cathy's skin tones were



Opposite page: Small sculpin—Nikonos camera, 1:1 extension tube, f22, two Ikelite Substrobes. Above: Cathy Church and small octopus—Nikonos, 15 mm lens, f4, Mark 100 strobe. Left: A ringed nudibranch—using the same technique as the sculpin.

AGFACHROME 50

Estimated Strobe to Subject Distance Ranges for Extension Tube Exposures

Extension tube size	Low power strobe/setting	Medium power strobe/setting	High power strobe/setting
1:1	3-6'' at f16	3-6'' at f22	4-8'' at f22
1:2	4-8'' at f16	4-8'' at f22	6-12'' at f22
1:3	5-9'' at f16	5-9'' at f22	7-13'' at f22

Example: With a 1:2 tube and a medium power strobe, the strobe to subject range is four to eight inches at f22. Use four inches for dark subjects, six inches (mid-range) for average subjects and eight inches for light subjects.

a neutral flesh color. They didn't have the orange, blue or yellow-green tint we have seen with some other color slide films. Keep in mind, however, that good color is a highly subjective judgement.

Because Agfachrome 50 has a relatively slow ISO film speed, it requires relatively bright U/W conditions for scenic shots. At a depth of about 25 to 35 feet, in clear water with an overhead sun, the aperture for a sunlight exposure with a level camera angle would be close to f4 at 1/90 second or about f4-5.6 at 1/60 second. With a slight upward camera angle, you might be able to close down another stop. Upward silhouettes would probably require an f16.

With a low power strobe or low power

setting, the aperture for a strobe-to-subject distance of three apparent feet will be about f4. With a medium-power strobe or power setting, try f5.6. And, with a high power strobe or power setting, try f8. For close-up photography with supplementary close-up lenses and a measured strobe-to-subject distance of 12 inches, try f11 with low power, f16 with medium power and f22 with high power.

Agfachrome 50 is available in 36 exposure cassettes of 35 mm film. Agfachrome 50 CT (processing included) retails for \$12.18. Agfachrome RT (without processing) retails for \$6.18. For more information, write directly to: Agfa-Gevaert Inc., 275 North Street, Teterboro, New Jersey 07608.

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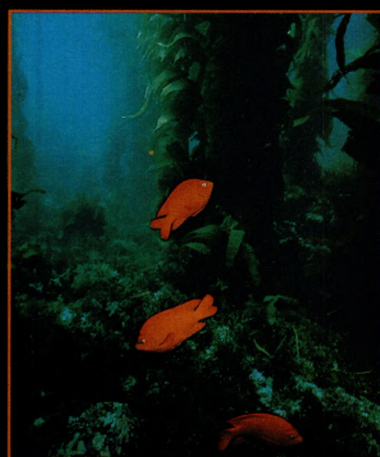
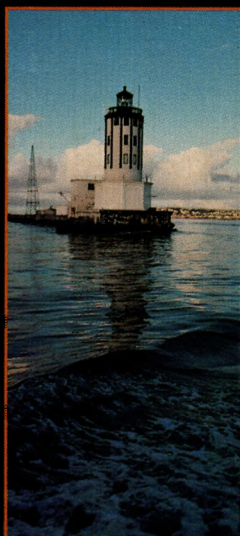
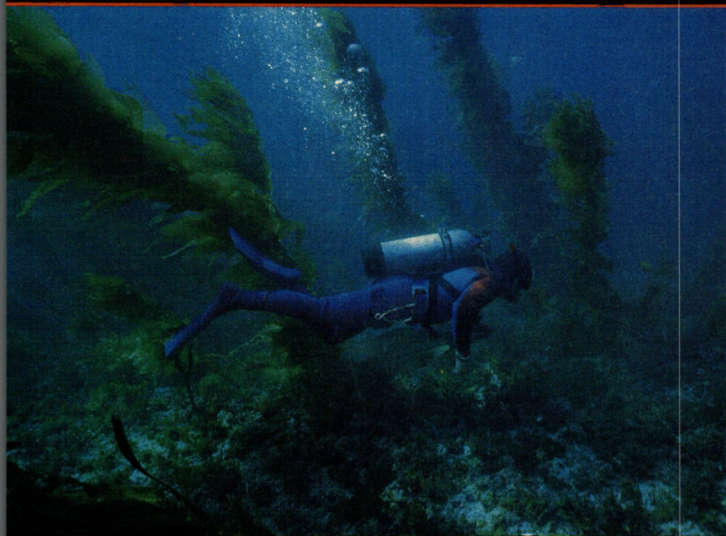
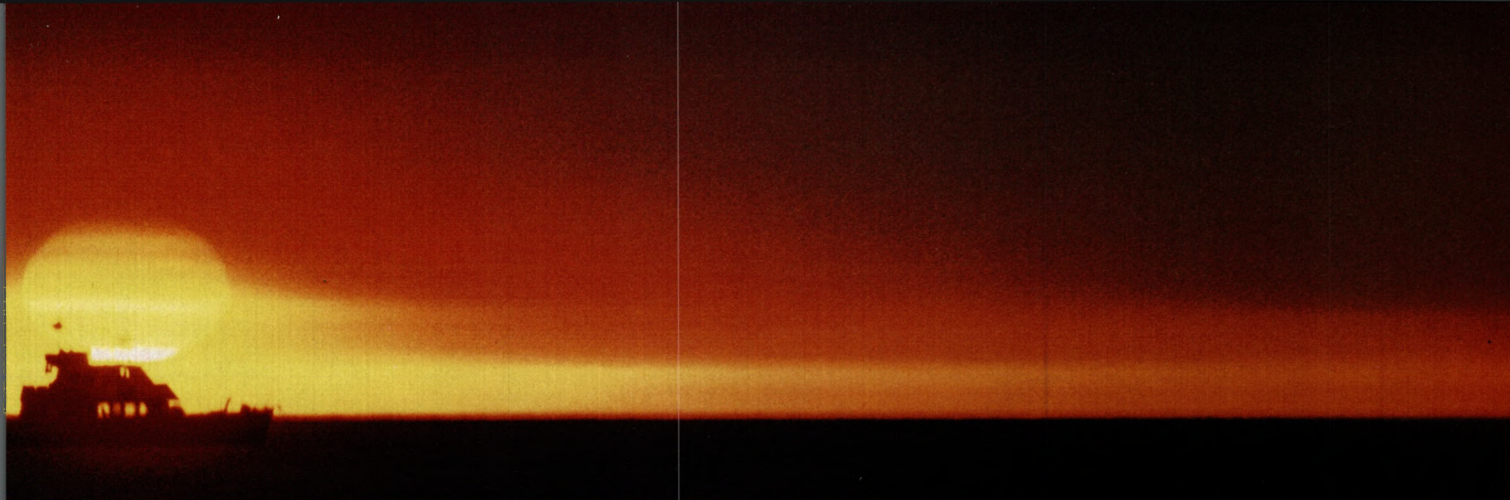
When I came to California, I knew there was one island off its coast—Catalina. It wasn't until I became a diver I found out there were seven more. And, not only were all eight islands diveable, so were several pinnacles, large rocks and reefs off their shores. I started diving at Catalina and Santa Cruz. Santa Barbara, Santa Rosa and Anacapa merely whetted my diving appetite for Farnsworth and Cortes Banks, San Nicolas,

San Miguel and San Clemente. Somewhere along the line I visited Bird, Ship, Begg and Wilson Rocks. During my early diving days I looked for shells and collected game: abalone, scallops, lobster. I even tried spearfishing.

Five years ago I took up U/W photography and four years ago I was introduced to wreck diving. The *Valiant*, *Gregory*, *Butler*, *Koka* and *Winfield Scott* were added to my diving vocabulary.

The point of this dissertation on my diving career is the incredible variety California diving offers. Is there any kind of diving we don't do? Well, yes, since our ocean waters never freeze, we don't ice dive! And, we don't really have tropical diving. Although El Nino has produced water temperatures of 74°F, that is unusual. The norm is water ranging from 54°F (during the winter) to 64°F (in the summer). Air temperatures are generally

TEXT AND PHOTOGRAPHY BY BONNIE J. CARDONE



The eight California Channel Islands offer something for almost every diver: wrecks; colorful macro and wide angle photo subjects; game such as abalone, lobster and scallops; and scenic kelp forests. Since the islands are anywhere from 11 to 70 miles from the coast, the diving is mostly done off charter boats.



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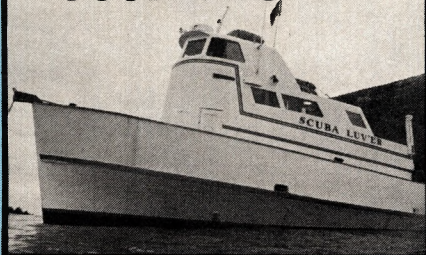
GETTING THERE

Since the nearest Channel Island (Anacapa) is 11 miles from the mainland and the farthest (San Nicolas), about 70, with the exception of Catalina, these islands may be dived only from boats. And, the vast majority of divers travel to the islands aboard charter dive boats. There are more than 20 of these, leaving from

four locations: Santa Barbara, Oxnard/Ventura, San Pedro and San Diego. They are well-equipped, live-aboard type boats for the most part, ranging in size from Truth Aquatics' new 90 foot luxury vessel (to be in service this summer) to the very comfortable *Charisma* and *Conception* (both 80 feet long) to the 42 foot *Barbara Marie*. The *Peace*, 65 feet long, even has a saltwater spa! With a couple of excep-

tions, most boats have compressors; galleys that serve hot meals; heads and showers; bunks with pillows and blankets. The larger boats carry 25 to 35 divers; two smaller boats, the *Moonraker* and *Excalibur*, cater to groups of six or less. The captains and crews of all the vessels are conscientious, experienced boat handlers and most are divers as well. If your group has a particular objective in mind, such as ab collecting or macro photography, let the captain know

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Diving in California is a bargain. The least expensive boat trips, to Catalina or Anacapa, cost about \$30; air and food are extra. The most expensive trips, to San Nick, for example, cost about \$50, with air and food extra. You will get at least five hours of diving and the boats move frequently, offering you a variety of sites to choose from. The larger boats offer multi-day trips. For about \$75 per day you get almost unlimited diving with all food, air and non-alcoholic beverages included. The San Diego boats also include weightbelts and tanks.

THE NORTHERN ISLANDS

Of the eight islands, Anacapa, Santa Cruz, Santa Rosa and San Miguel are called the Northern Channel Islands. Along with Santa Barbara, they comprise the Channel Islands National Park. Santa Cruz and Santa Rosa are privately owned; the other three islands are owned by the federal government.

The waters for one mile around each of the National Park islands are an ecological preserve. This means you may not take anything that isn't covered by California Fish and Game Laws.

The Channel Islands National Park Headquarters, at 1901 Spinnaker Drive, Ventura, (805) 644-8262, is well worth a visit. There are interesting exhibits on the islands' history and marine life and a movie about them. Books, postcards and slides are for sale.

ANACAPA

Anacapa is the island closest to the California coastline, just 11 miles from Oxnard, 25 from the city of Santa Barbara. Almost five miles long, it is actually three separate islands: East, Middle and West. Most of the northeast side of Anacapa is closed to game taking. **Gold Fish Bowl**, off West Anacapa, is a good site for beginners, with waters averaging 30 feet deep. Truth Aquatics' skipper, Terry Hite, calls **Coral Reef**, on the south side of the same island, "a Wykoff Ledge for beginners." It features a wall dropping from 30 to 100 feet. It should be dived only under the best of conditions: Watch for currents. Further east is **Cat Rock**, featuring tumbled boulders and ledges down to 70 feet.

The wreck of the **Winfield Scott** is near the northeast end of Middle Anacapa. This paddlewheel mail steamer went down in 1853 taking with it a fortune in gold, most of which was salvaged. A number of gold coins were found in the 1960s. Now, however, removing even as much as a nail will get you into trouble



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15-16-17-18	Stan's Skin Diving Shop	408-998-0767
19 thru 23	Bottom Timers	206-573-7563
24	Discovery Charters	213-790-8276
25 & 26	Wet Pleasure	408-984-5819
27-28-29	Divers West	818-796-4287
31st thru Sept. 2	Aqua Adventures Unltd.	818-342-4170
Sept. 6-7-8	Finstad's Scuba Adventures	408-476-5201
13 & 14	Discovery Charters	818-790-2717
15 & 16	Pinnacles Dive Center	415-897-9962
20 & 21	Tom Campbell	805-965-4901
22 & 23	Wet Pleasure	408-984-5819
26-27-28	Stu's Scuba Tours Unltd.	415-283-8343
29 & 30	Stu's Scuba Tours Unlimited	415-283-8343
Oct. 2-3-4-5	Ocean Odyssey	408-475-3483
6-7-8	Discovery Charters	818-790-2717
9 & 10	Any Water Sports	408-244-4435
11 & 12	Desert Divers	702-438-1000
13-14-15	Lodi Skin Diving	209-333-2343
17-18-19	Finstad's Scuba Adventures	408-476-5201
20 & 21	Wet Pleasure	408-984-5819
24-25-26	Neptune's Realm	707-445-3701
27 & 28	Tom Campbell Group	805-965-4901
Nov. 1 & 2	Aqua Adventures Unltd.	818-342-4170
3 & 4	Glendale I.D.S.	213-320-1681
7-8-9	Stu's Scuba Tours Unltd.	415-283-8343
10 & 11	Stu's Scuba Tours Unltd.	415-283-8343
15 & 16	L.A. U/W Photo Society	818-790-3991
17-18-19	Inter-Ocean Tours	415-444-5833
21-22-23	Stu's Scuba Tours Unltd.	415-283-8343
24 & 25	Stu's Scuba Tours Unltd.	415-283-8343
26 & 27	U.C. Santa Cruz	408-462-5409
28-29-30	Aqua Adventures Unltd.	818-980-1271
Dec. 6-7-8	Stu's Scuba Adventures	415-283-8343
13 & 14	Dave Faught	408-371-4541
27-28-29	Stu's Scuba Tours Unltd.	415-283-8343

1985 MULTI-DAY TRIPS ABOARD TRUTH

When	Who	Phone
May 3 & 4	Pinnacles Dive Center	415-897-9962
5 & 6	Aloha Diving Schools	818-343-6343
10 & 11	Aqua Adventures Unlimited	818-980-1271
17-18-19	Aquarius Dive Shop	408-375-1933
25-26-27	Ocean Odyssey	408-475-3483
June 1-2-3	Flipper Dippers	408-446-1908
7-8-9	Aquarius Dive Shop	408-375-1933
14 & 15	Dave Faught	408-371-4571
21-22-23	Sea Sabers	714-738-4333
29 & 30	Any Water Sports	408-244-4435
July 4-5-6	Aqua Adventures Unltd.	818-342-4170
7 & 8	Salt Water Revival	415-525-6229
14 & 15	Divers Corner	213-927-1417
19 & 20	Discovery Charters	213-790-2717
21 & 22	Open Water Habitat	714-633-7283
25-26-27	San Francisco Reef Divers	415-487-6394
28 & 29	Any Water Sports	408-244-4435
Aug. 2 & 3	Aqua Adventures Unltd.	818-342-4170
4-5-6-7	Dave Faught	408-371-4541
9 & 10	Sea Sabers	714-544-1853
11 & 12	Aloha Diving School	818-846-1320
16 & 17	Stu's Scuba Tours Unltd.	415-283-8343
23 & 24	Stu's Scuba Tours Unltd.	415-283-8343
25-26-27-28-29	Boulder Scuba Tours	303-449-8606
31st-Sept. 1-2	Blue Fins Dive Club	213-391-0948
Sept. 6 & 7	Hughes & TRW Scuba Clubs	213-823-2552
13 & 14	Sea Sons Dive Club	714-829-7155
15-16-17	New England Divers	415-434-3614
20 & 21	Cypress College	714-553-1889
22 & 23	Divers Corner	213-927-1417
29	Blue Fins Dive Club	213-391-0948
Oct. 2 & 3	Finstad's Scuba Adventures	408-476-5201
4 & 5	Sea Sons Dive Club	714-829-7155
6 & 7	Saltwater Revival	415-525-6229
8-9-10	Ron Barney	415-388-8124
11 & 12	Aqua Adventures Unltd.	818-342-4170
13-14-15	Aquarius Dive Shop	408-375-1933
18 & 19	Triton's Dive Club	415-494-1628
20 & 21	Blue Fin Dive Club	213-991-0261
25 & 26	Sea Urchins	408-722-6744
27-28-29	Stu's Scuba Tours Unltd.	415-283-8343
Nov. 1-2-3	Sea Sabers Dive Club	714-544-1853
7-8-9	Dolphin Scuba Diving	916-929-8188
10 & 11	Hughes & TRW Scuba Club	213-607-1005
15 & 16	John Larson	415-435-0523
17 & 18	Stu's Scuba Tours	415-283-8343
22 & 23	Pacific Offshore	408-294-7634
28-29-30	Desert Divers	702-438-1000
	Mid West Divers	303-484-8528
Dec. 14 & 15	Any Water Sports	408-244-4435

1985 MULTI-DAY TRIPS ABOARD THE NEW BOAT

When	Who	Phone
June 16-17-18	Dolphin Scuba Diving	916-929-8188
20-21-22	Stu's Scuba Tours Unlimited	415-283-8343
23 & 24	Sports Cove	707-448-9454
	Trivaly Scuba	415-828-5040
28 & 29	Stu's Scuba Tours Unlimited	415-283-8343
30 thru July 3	Adventure Sports	408-458-3648
July 4-5-6-7	Finstad's Scuba Adventures	408-476-5201
12 & 13	Tom Campbell Group	805-965-4901
14 & 15	Aloha Diving School	818-343-6343
18-19-20	Stu's Scuba Tours Unltd.	415-283-8343
21 & 22	Wet Pleasure	408-984-5819
25-26-27	Inter-Ocean Tours	415-444-5833
28 & 29	Bamboo Reef	415-362-6694
Aug. 1-2-3-4	Finstad's Scuba Adventures	408-476-5201
8-9-10	Bottom Time	916-885-FROG
11 & 12	Water Pro	805-543-3483
13 thru 17	Aquatic Center	714-650-5440
	Tom Campbell Group	805-965-4901
18 & 19	Stu's Scuba Tours Unltd.	415-283-8343
20 thru 24	Malibu Divers	213-456-2396
25 thru 29	Anchor Shack	415-825-4960
30 thru Sept. 3	Adventure Sports	408-548-3648
Sept. 1-2-3	Adventure Sports	408-458-3648
4-5-6-7	Any Water Sports	408-244-4435
8 & 9	Aloha Diving School	818-343-6343
13 & 14	San Diego U/W Photo Society	619-277-6363
15-16-17	Inter-Ocean Tours	415-444-5833
20 & 21	Aqua Adventures Unltd.	818-342-4170
22 & 23	Stu's Scuba Tours Unltd.	415-283-8343
27-28-29	Calif. Wreck Divers	213-390-5171
Oct. 2-3-4-5	Finstad's Scuba Adventures	408-476-5201
6-7-8	Adventure Sports	408-458-3648
10-11-12	Black Barts	714-496-5891
13 & 14	Flipper Dippers	408-446-1908
17-18-19	Stu's Scuba Tours Unltd.	415-283-8343
20-21	Anchor Shack	415-825-4960
22	Divers Corner	213-927-1417
24-25-26	Water Pro	805-543-3483
27 & 28	Stu's Scuba Tours Unltd.	415-283-8343
29-30-31	Lompoc Dive Club	805-735-1593
Nov. 1 & 2	Bamboo Reef	415-362-6694
3-4-5	Finstad's Scuba Adventures	408-476-5201
7-8-9	New England Divers	415-434-3614
10-11-12	Tom Campbell Group	805-965-4951
14-15-16	Main Skin Diving	415-479-4332
17-18-19	Any Water Sports	408-244-4435
21-22-23	Adventure Sports	408-458-3648
24 & 25	Wet Pleasure	408-984-5819
26 & 27	Bob Widmann	408-462-5409
28-29-30	Stan's Skin Diving Shop	408-998-0767
Dec. 1 & 2	Hughes & T.R.W.	213-607-1005
3-4-5-6	Cal. Academy of Sciences	415-668-7376
7-8-9	Finstad's Scuba Adventures	408-476-5201
14-15-16	Anchor Shack	415-825-4960
20 & 21	Discovery Charters	818-790-2717
28-29-30	Undersea Tours	503-883-2016
31st thru Jan. 1, 1986	Divers Corner	213-927-1417

Channel Islands

with the Park Service. There isn't much of the *Winnie* still to be seen, but look, do not touch!

SANTA CRUZ

About 24 miles from the city of Santa Barbara, Santa Cruz is the largest Channel Island. It is 24 miles long and has the tallest mountain of any of the islands, 2,400 feet high. Chumash Indians lived here for more than 6,000 years. The island has been used for ranching since 1839. With 77 miles of coastline, Santa

Cruz offers an incredible variety of dive spots, truly something for everyone. When the seas are calm and the sun shines, diving here is really something special. You could spend a week, anchoring in protected coves, over pinnacles and near caves, making half a dozen dives a day, without seeing everything it has to offer.

When the winds blow and the seas are rough, **Gull Island** may be the only diveable area in the Northern Channel Islands. Depths range from 30 to 40 feet. There is lots of kelp and still some game to be found. Off the seaward side is a wall dropping from 20 to 100 feet. **Yellowbanks**, named for its sandy seaside



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cliffs, is a good lobster spot. Depths reach 40 feet and the rocky bottom provides lots of hiding places for bugs. **Cavern Point** is a good spot for beginners with depths averaging 30-40 feet and dropping to 60.

SANTA ROSA

This is the second largest Channel Island. Almost 15 miles long and about 10 miles wide, it is about 30 miles from Santa Barbara. Santa Rosa and San Miguel are probably the least dived of all the Channel Islands. For this reason game is abundant. And, in some spots California's only true cowrie, the chestnut, seems to be everywhere.

In lobster season everyone's favorite spot is **Talcott Shoal**. This area is 20 square miles of ledges and rock piles. Depths range from nine feet to very deep. The high point is one and one-half miles offshore. Because of the weather, Talcott is often undiveable. The wrecks of the **Aggi** and the **Golden Horn** are in this area.

East of Talcott and three-quarters of a mile offshore is **Rodes Reefs** with its ledges, rocks and big boulders. It goes down to 70 feet. **East Point** is a dive spot featuring a series of pinnacles one-half to two and one-half miles offshore. The depths range from 30 to 80, 45 to 90 and 60 to 140 feet. There are lots of scallops and game fish. Look for the beautiful purple and gold ringed top shell among the *Corynactis* anemones.

A favorite nighttime anchorage for multi-day trips is **Johnsons Lee**, on the south side of Santa Rosa. It has lots of kelp and depths ranging from 30 to 40 feet. This is a good, calm place for a night dive. On shore you can see the remnants of an abandoned Air Force Base.

SAN MIGUEL

Eight miles long and four miles wide, San Miguel is about 53 miles from Santa Barbara. It is the westernmost of the Channel Islands and its windswept shores are home to large numbers of seals and sea lions. Although each of the Channel Islands is unique, San Miguel's caliche forests have to be seen to be believed. These weird sandcasts were formed when living plants became covered with windblown sand.

Because San Miguel sits exposed to the elements, it is not always diveable. When you can dive it, it's a special treat. **Wilson** and **Richardson Rocks** are off Miguel's northern shore. These are beautiful pinnacles covered with anemones and other marine life. Because they are in the open ocean, they are often undiveable and for experienced divers only.

Wycoff Ledge, one-quarter mile from the island's southern shore, is one of the prettiest of all California dive spots. This reef is about one-eighth mile long and the two high spots come to within 9 and 12 feet of the surface. The outside ledge drops to 120 feet. The sandy bottom of

DIVING IN KELP

Although novices may find kelp intimidating, experienced divers consider it a friend. It's something to hold onto in the surge or a current or if your weightbelt falls off and you suddenly become overly buoyant. It provides a home for marine life and is very photogenic.

Certain equipment adjustments can make kelp diving easier. Wear your knife on the inside of your leg. Keep all hoses and gauges close to your body with hose guides. Put the straps on your fins inside out so the ends are next to your foot. Wrap duct tape around the fin buckles so kelp strands don't catch on them. Kelp cuts easily and breaks relatively easily, too. If you get entangled, don't twirl, stay in one place; reach around and untangle yourself.

Surface kelp swimming is an art and when you have done it once you'll plan your next dive so you won't have to do it again! The secret is to crawl over the top, pushing the strands in front down and under you. This is a slow process. If you are a well equipped diver you'll have to stop frequently to remove those strands that catch on whatever isn't absolutely flat against your body.

TAKING GAME

Anyone over the age of 16 who wishes to take game in California waters must have a California sport fishing license. These are sold at sporting goods stores and the sport-fishing landings from which dive boats depart.

To take game in Channel Island waters you need an ocean fishing license. This will cost a California resident \$9 and is good from January 1 to January 1. Non-residents can get a five day ocean only license for \$9 or a 10 day ocean only license for \$14.75. Both residents and non-residents can get a one day ocean only license for \$4.25.

When you buy your fishing license, also pick up a copy of the Fish and Game Rules. These change each March. There are two versions. The one printed in color is the summary and not all regulations pertaining to divers are contained in it. The complete set is on newsprint in black and white.

For your information, scallops may be taken year-round; abalone season runs from March 16 to January 14; lobster season runs from the first Wednesday in October through the first Wednesday after March 15.

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Channel Islands

Simonton Cove is a good halibut spot. **Judith Rock** and **Cuyler Harbor** are popular dive spots. The latter is the area in which Juan Rodriques Cabrillo, discoverer of California, is supposed to have died in 1543.

THE SOUTHERN ISLANDS

The Southern Channel Islands include Santa Catalina, Santa Barbara, San Clemente and San Nicolas. Their waters are generally warmer, calmer and clearer than those of the Northern Islands. They get more diving pressure and game is not quite as abundant, nor as large as that found farther north. They are far from barren, however. Wide angle photography can be excellent and there are numerous macro subjects. The wrecks are diveable more often. Abalone, scallops, fish and lobster are there for those who like seafood dinners.

SANTA CATALINA

Santa Catalina is just 22 miles from San Pedro. Eighteen and one-half miles long and seven miles wide, it is the only Channel Island with a city, Avalon. Interesting and picturesque, it offers a variety of non-diving activities including glass-bottom boat rides and tours of the island (you'll see buffalo and wild boar). There are also tours of the Casino and it houses a museum (open daily in the summer, on weekends in the winter) that is worth a visit. Just off the Casino is an underwater park, the scene of many checkout dives year-round. Catalina Divers Supply offers air fills and rental gear both at the park and on the Pleasure Pier in town.

For sightseers and photographers, Catalina has much to offer. Non game animals are plentiful. Garibaldi and blue banded gobies seem to be everywhere. Many dive sites are perfect for novices. These include **Hen Rock**, the **Rock Quarry**, **Bird Rock**, **Isthmus Cove** (site of the only recompression chamber on any of the islands), **Emerald Bay**, **Parson's Landing**, **Arrow Point Cove** and **Iron Bound Cove**. Experienced divers will enjoy **Ship Rock**, **Eagle** and **Dismal Reefs** as well as the wreck of the **Valiant**, just off the Avalon Casino.

Farnsworth Bank is Catalina's most exciting and beautiful dive, but it is accessible only in good weather. Pinnacles here come to within 60 feet of the surface, dropping to 150. This is a dive for very experienced divers. Farnsworth is an underwater preserve so only animals listed in Fish and Game rules may be taken. The site is noted for its purple hydrocoral and other marine life is prolific as well.

SANTA BARBARA

Thirty-eight miles from San Pedro, Santa Barbara is the smallest of the

Channel Islands. About 640 acres in area, it is ringed with steep cliffs. Those wishing to visit the island must climb stairs rising 100 vertical feet. There's a self-guiding nature trail and limited camping is allowed with permit; you must bring all supplies with you and carry out all your trash. A park ranger is stationed on the island almost all year.

Sea lions and harbor seals are abundant at Santa Barbara and you have a good chance of seeing one or more almost anywhere your boat anchors.

Both novice and experienced divers will enjoy most Santa Barbara dive sites. One of the prettiest is **The Arch** and **Arch Reef**. On a calm day The Arch can be hard to find, but most of the time waves break over it. It is undiveable in rough weather. The reef leading to the

cent wreck of tug, which appears to have gone down in a 1983 winter storm. The deliberately scuttled **Butler** is in the middle of Northwest Harbor. Diveable only in very good weather is the **Gregory**, on the backside of the island.

Clemente has long been known as "the home of the shorts" or the "lobster nursery." It seems to have an incredibly large number of baby lobsters. Some crevices bristle with the antennae of these juveniles, who walk all over each other in their eagerness to get a look at you, looking at them. Amazingly, once they reach legal size they become considerably more reclusive. Other game is fairly common around the island. There are big fish and nice sized abs.

A very special dive site at Clemente is the **Coral Gardens**, also known as the



large arch is covered with anemones, purple coral and other colorful macro life. It drops straight down to 100 feet. There is about 40 feet of water under the Arch, which is about 30 feet wide. Most Santa Barbara dive sites are nameless but there are **Shag** and **Sutil Rocks**. A ledge off Sutil is a great macro spot.

Other dive sites well worth a visit include: **Brittle Star Reef**, **Halibut Hole**, **Three Sisters** and **Pete's Reef**

SAN CLEMENTE

Some 40 miles from San Pedro, San Clemente is owned and occupied by the Navy. It's about 18 miles long, but only four miles wide. Most of the time the island is quiet, but it isn't always. Occasionally the Navy's War Games are held out here. Then you'll see large gray ships on the horizon and there will be a lot of plane activity. San Clemente has a number of wrecks. Some went down accidentally, but many were victims of Navy target practice. The **Koka** ran aground East Point of Northwest Harbor more than 50 years ago. A short swim away is the re-

Seven Fathom Spot, northwest of Castle Rock. This reef has the beautiful purple hydrocoral, *Allopora californica*, growing all over it.

SAN NICOLAS

The most distant Channel Island is San Nicolas. It's 70 miles from the mainland. Eight miles long and three miles wide, it resembles a large sand dune. The diving around this Navy owned island is almost virgin in spots. Large sheephead follow divers around like packs of dogs. On a recent visit, large ocean whitefish were equally curious.

San Nick should only be dived by experienced divers. It can be quite rough. This is especially true of **The Boilers**. If you can't handle surge and white water stay out of this area. Veteran bug divers love it because big lobster (11 pounds and larger) are pulled from the rocks here every year. Most of San Nick's dive spots are unnamed, but try **Middle Light**, **Hell Hole**, and **Kenny's Reef**. When the weather is bad you'll probably end up in **Dutch Harbor**, the island's only semi-protected anchorage.

FLORIDA MARINE CENTER

Ian G. Koblick, president of Marine Resources Development Foundation and Alan Ford, executive vice president, have announced a June opening of the Marine Resources Development Center in Key Largo, Florida. The approximately three acre facility will be operated in association with state and private educational institutions and will carry out environmental training programs for students, marine research scientists, law enforcement agencies, fire departments, paramedics, search and rescue units and qualified sport divers.

Other activities at the new center will include research and development projects aimed at producing food and other of the ocean's resources.

The focal point of the new facility is the Marine Resources Underwater Classroom Laboratory which will be moved to the new site. This unusual lab is the first of its kind in the continental United States.

HELL DIVERS RODEO

The Hell Divers Scuba Club will hold its 22nd annual Spearfishing Rodeo May 30-June 2. Taking place at West End Park in New Orleans, it is the largest spearfishing tournament in the South. A total of 38 awards are given. For more information call (504) 833-1884.

WRECK FACTS

(Continued from Page 14)

wrecks many oldtimers didn't realize were sunk in their own backyard. Details of the *Lago Mar*, Cannons, the Jade Beach Wreck, the Barefoot Mailman Wreck and many others reveal the historic significance of Broward County's underwater time capsules. The book, only \$5 including postage, is available from: Steve Singer, 2341 N.E. 27th Terrace, Pompano Beach, FL 33062.

Ft. Dodge is a long distance from the Florida Keys, but Gary Keyser, "the Ft. Dodge man," has written a fascinating and functional paperback called *Finding the Spanish Treasure Galleons of the 1733 Fleet*. Two years in the making, Keyser's book actually lists latitude, longitude and Loran numbers for 20 treasure galleons in addition to photos of landmarks on shore. Wrecks include *El Infante*, *San Jose*, *La Capitana* and many others. The books are available from: Treasure Book Company, P.O. Box 1694, Ft. Dodge, Iowa 50501; price: \$29.95 plus \$3 shipping.

That's all for now. Safe diving to all—Ellsworth Boyd, Rt. 2, Box 408, 1120 Bernoudy Rd., White Hall, Maryland 21161. Please enclose a stamped, self-addressed envelope when writing for wreck information.

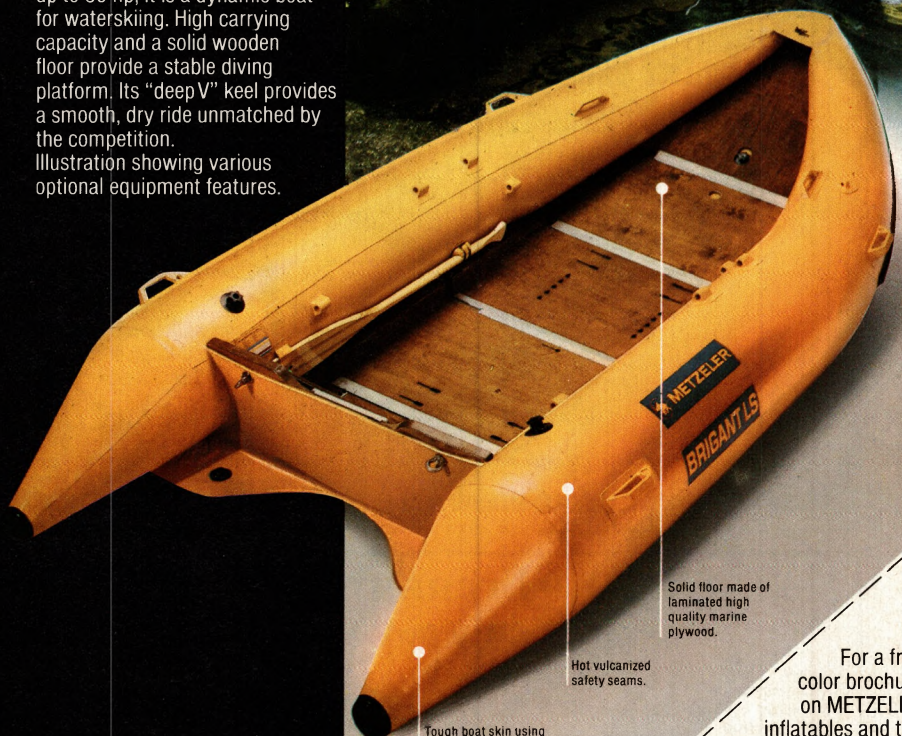
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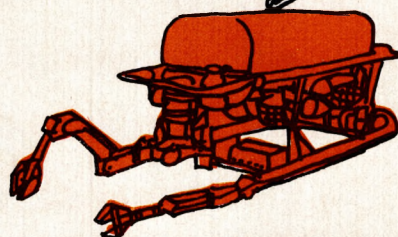
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Diver's Calendar

April 5 North Atlantic Wreck Divers of Delaware Scuba Swap Meet at the Delaware Association of Police Building, 2201 Lancaster Avenue, Wilmington, DE. Sponsored by the DuPESSDA Skin and Scuba Diving Association and the Delaware Underwater Swim Club, Inc. Free admission, dealers welcome. (Contact: Scott Jenkins, P.O. Box 7743, Newark, DE 19714; (301) 392-3690)

April 13 Temple University's Ninth Annual Man and the Sea Conference at Bellevue Stratford Hotel, Philadelphia, PA. Lectures, slide shows and workshops during the day and a film festival at night. Door prizes. Tickets \$20 at the door. (Contact: Dr. Robert Leahy, Temple University, (215) 787-8720)

April 20 Seavue '85, the Southeast Virginia Underwater Expo, featuring the Stan Waterman Show, seminars, exhibits and door prizes, will be held at the Chamberlin Hotel in Hampton, Virginia. (Contact: Seavue '85, Marine Advisory Services, Virginia Institute of Marine Science, Gloucester Point, VA 23062; (804) 642-7173)

April 27-28 Seven Seas' annual Diver's Festival, featuring Jack McKenney's film show, Dive to Adventure. (Contact: Keith Sliman, Seven Seas, 3625 Perkins Road, P.O. Box 14973, Baton Rouge, Louisiana 70808; (504) 389-0026)

May 4 Princeton Scuba Club Auction and Equipment Swap at the Princeton Junction Firehouse, Princeton Junction, NJ. Swap starts at 1:00 pm and auction at 3:00 pm. (Contact: Princeton Scuba Club, P.O. Box 160, Princeton, NJ 08550)

May 17-19 Our World-Underwater exhibition at the Hyatt Regency-Chicago and Medinah Temple, Chicago, IL. (Contact: Our World-Underwater, P.O. Box 4428, Chicago, IL 60680; (312) 664-4971)

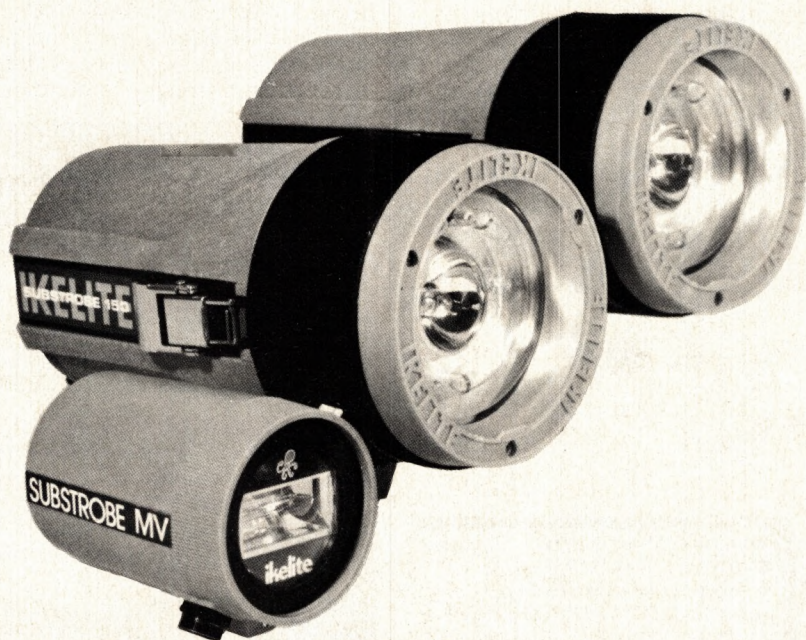
May 17-19 Fifth Annual Underwater Investigations Seminar, sponsored by the Hamilton County Police Association Underwater Search and Recovery Unit at the Radisson Hotel, Cincinnati, OH. (Contact: Det. Michael D. Wylie, Amberly Village P.D., (513) 531-2040; or Spec. Al Gille, Deer Park Police, (513) 791-8056)

May 19-25 International Society of Aquatic Medicine annual meeting at the Flamingo Beach Hotel, Bonaire, Netherlands Antilles. (Contact: Michael Rosco, M.D., 1127 Wilshire Boulevard, Suite 809, Los Angeles, CA 90017)

June 16 Seamark 1985, a diver sponsored underwater treasure hunt/fund raiser for the Coting School for Handicapped Children, at Great Island Common, Newcastle, NH. (Contact: Kathleen E. Simon, Chairman Seamark Treasure Hunt, 51 Willow Ave., Winthrop, MA 02152; (617) 846-7191)

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with TTL



TTL AUTOMATION

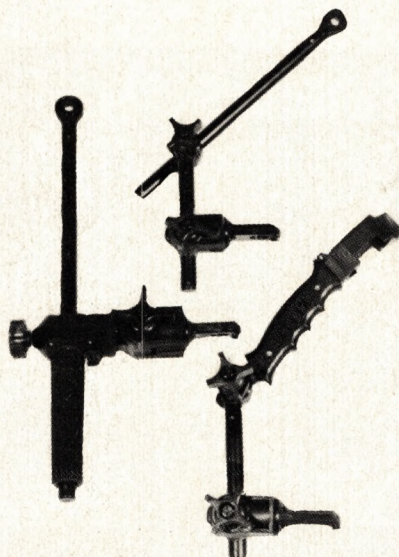
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NON-TTL AUTOMATION

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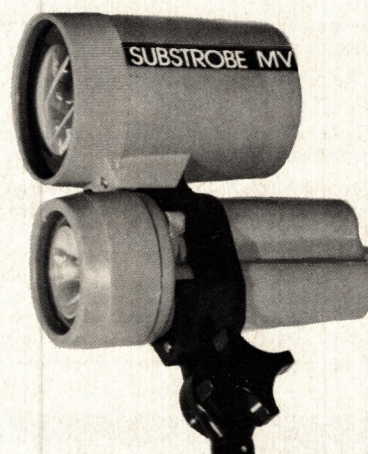


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The Quick Handle is especially suited for the larger SUBSTROBES. It features an 18 inch adjustable arm and quick release for easy hand holding. The Strobe Arm and Strobe Handle are more suited for the smaller SUBSTROBES. They are available in single and double section models for added versatility and both accept the Lite Bracket.

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The Lite Bracket permits the Ikelite Mini C-Lite to be used as an aiming/modeling light with the M series SUBSTROBES. This combination is ideal for night photography.



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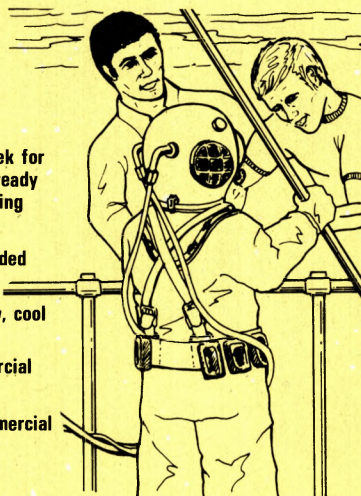

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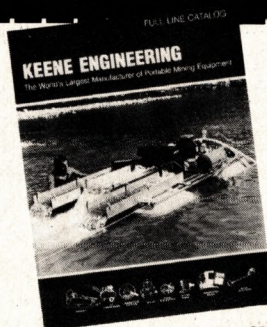
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GREAT LAKES TIME CAPSULES

The Dossin Great Lakes Museum, on Belle Isle in Detroit, has created a unique exhibit to document Michigan's maritime heritage. Some 3,000 square feet of the museum have been transformed into the exhibit—Michigan's Nautical Time Capsules. In this interpretive exhibit the public



will see the condition of sailing and steam vessels lost in Michigan waters between the 1850s and 1970s.

The exhibit was made possible through a \$27,000 matching fund grant from the U.S. Department of Commerce, National



Oceanic and Atmospheric Administration; Michigan Department of Natural Resources, Division of Land Resource Programs and the City of Detroit.

A select group of intact vessels is presented and fully documented with models, drawings, photographs and artifacts. Numerous Great Lakes historians, divers and artists supplemented the resources of the museum in the production of the exhibit. The non-diving public for the first time can see the condition of a 19th century ship's figurehead or the pilot house of a steamer lost in 1975.

The museum is open Wednesday through Sunday, from 10:00 am to 5:30 pm.

SCUBAPRO VIVA

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TEXT AND PHOTOGRAPHY
BY BONNIE J. CARDONE

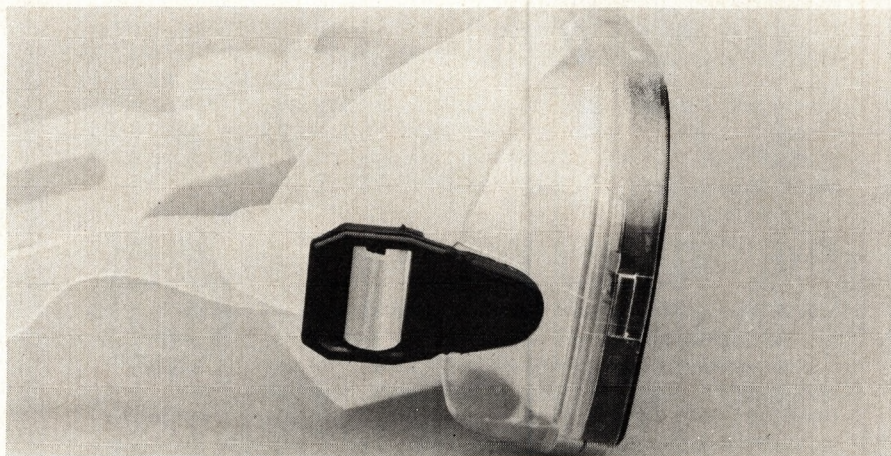


Need a new mask? Shopping for your first? Take a look at Scubapro's neat little Viva, in crystal silicone rubber. It's a lightweight, low volume mask that should fit most faces. The silicone rubber is hypoallergenic and soft, molding comfortably to the face. Because it's silicone it is resistant to the effects of ozone and ultraviolet light. It will last practically forever and keep its flexibility. This means you'll never get the black ring-around-the-face that is caused by deteriorating neoprene rubber masks.

Features of the Viva include a single sealing edge on the skirt and a one piece, tempered glass lens. This latter allows wide angle as well as good downward vision. The silicone skirt lets light enter, reducing tunnel vision and making the wearer's face photogenic. Peripheral vision is increased because you can see through the translucent skirt.

The two piece Viva frame is a clear, high impact polycarbonate with a black lens retainer. This latter gives the mask a stylish, futuristic appearance.


The head strap is one piece with three slots, giving it the strength of a one piece strap but the advantages of a split head strap. The strap ends are secured with a set of unique buckles of nylon. These swivel 180 degrees to allow precise posi-



tioning and to make the mask more compact for packing. They are also easily removed. The straps are easy to adjust—just pull on the ends to tighten—but cannot slip out of the buckles.

Scubapro was the first company to offer a silicone mask. The first two models were introduced in 1976. Then the rubber was milky white, now it's crystal clear. To keep it that way, don't let it come in contact with black rubber items. If you put your clear silicone mask on top of your neoprene wetsuit it will turn yellow. A

black snorkel (and snorkel keeper) will have the same effect. Other than keeping the mask away from neoprene (which only affects its looks), the Viva needs no special care. Just rinse and let dry when your diving day is over.

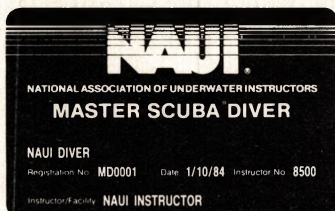
The Viva, in crystal silicone, sells for \$52 at your Scubapro dealer. There is also a neoprene Viva, with a bright orange frame and white lens retainer, for \$26. For more information contact Scubapro, 3105 E. Harcourt, Rancho Dominguez, CA 90221. 

ONE

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SKIN DIVE SHOP CLOSES

On July 1 the doors of the Skin Dive Shop in Cookeville, Tennessee were closed forever when Will Crawford retired. For more than 25 years, Crawford instructed countless divers from all over the United States during their attendance at nearby Tennessee Technological University. An annual campout/checkout dive was the setting for a reunion of many of these past graduates. The last of these gatherings was held in May 1984; few dry eyes were to be found when the last tent was folded and the last mask packed.

SEA '85

The Northern California Chapter of the Underwater Photographic Society will present its 21st International Film Festival May 11. Sea '85 will be held at the Paramount Theatre of the Arts in Oakland, CA at 8:00 pm. Dr. John McCosker, director of San Francisco's Steinhart Aquarium, will be the master of ceremonies and film presentations will be made by Stan Waterman and Jack McKenney. The UPS membership will present their unique impression of a Point Lobos adventure entitled The Spirit of Point Lobos.

The International Film Festival Photo Competition is held each year in conjunction with the Sea festival and this year video has been added to the slide, print and movie categories. There will be presentations of awards for the winners of the various categories and a display of the winning pictures in the theater lobby.

For individual tickets, group sales and charge-by-phone sales for the festival, contact the Paramount Box Office, 2025 Broadway St., Oakland, CA 94612; (415) 465-6400.

LOBSTER NOSES

On the nose of the Florida lobster is a unique feature that promises to help scientists understand epilepsy better and might provide new ways to control it. University of Florida scientists at C.V. Whitney Marine Laboratory are studying the lobster's receptor for a chemical that arrests epileptic seizures in lab animals.

The chemical in question is taurine, a sulphur-containing amino acid. Found in the tissues of most animals, it occurs in relatively high concentrations in human brains and in human mother's milk. But the only known receptor for taurine is on the nose of the Florida lobster.

"It's a lot easier to work on something on the outside of a body like this," Ache said. "Also, lobster noses grow back, so you can use the same lobster over and over."

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New molded version includes new Coaster-Buoy™ insulated foam drink holder keeping drinks cold in beverage cans, bottles, and glasses. Mug-Buoy also holds mug with handle. Mug-Buoy easily detachable from flat surface mounting clip when not in use. **Model #500** chrome-plated steel and almond color. **Model #501** chrome-plated brass and almond color for use in salt water areas.



SAIL-BUOY™



New stainless steel wire model with special lifeline mounting hook. Holds beverage cans, bottles, glasses and new Drink-Buoy insulated drink container. Drink-Buoy, available separately, keeps drinks cold or hot. Always level when boat heels. **Model #302** stainless steel. Available at marine and recreational vehicle counters.





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Film Festivals 'n Symposia

OUR WORLD-UNDERWATER

The 15th annual Our World-Underwater will be held May 17-19 at the Hyatt Regency-Chicago Hotel, 151 East Wacker Drive, Chicago, IL.

This year's show will feature Amos Nachoum, president of La Mer Diving Safari, Inc.; Paula Novotny, underwater photographer/graphic artist; Rick Frehsee, U/W photographer; John Steele, "Dean" of shipwreck diving in the Great Lakes; and Lenora Carey, marine naturalist and film producer.

A cocktail party and reception in the special exhibit area begins on Friday, where key speakers and diving greats can answer questions and share their many experiences with diver and non-diver alike. This year's exhibit hall has been expanded to feature over 300 booths covering the latest developments in equipment, diving and photographic techniques, diving travel locations, certification programs, bottle collections, wreck artifacts and other subjects.

After the reception, it's on to the great whale dance which goes on and on.

On Saturday, at 9:00 am, seminars begin concurrently in five rooms—each capable of handling 500 people. Each room will host six half-hour presentations with visual material, slides or movies.

At 5:00 pm that evening the Scholarship Banquet will be held. The scholarship committee will be present to award the \$7,000 scholarship to this year's winner. Jay Moreland, the 1984 winner, will describe his fantastic year. Tickets to this event are available for \$25 per person.

Saturday evening's film festival will be staged at Medinah Temple. The films are first showings of documentaries, exploration and Emmy Award winners. Show time is 8:00 to 10:30 pm at 600 North Wabash Avenue. Following the festival, back at the Hyatt, the floors will be cleared and the wine will be poured for another dance spectacular, featuring a live band, visual presentations and special prize drawings.

On Sunday from 10:00 am until 1:00 pm, the how-to workshops will be held. You can learn how to collect, preserve, cook, restore and photograph your favorite subjects from the depths. A new workshop on shell collecting will be offered by the Chicago Shell Club. Also, there will be an in-depth study of fresh and saltwater wrecks, how to research and locate them and the legal aspects involved.

Our World-Underwater has arranged special per night room rates at the Hyatt

Regency-Chicago for the convention weekend. These special rates must be requested when reservations are made. Advanced, confirmed reservations are required to assure convention rooms. Make reservations before April 11 with the Hyatt Regency-Chicago, 151 East Wacker Drive, Chicago, IL 60601.

For information and tickets contact: Our World-Underwater, P.O. Box 4428, Chicago, IL 60680; (312) 664-4971.

SEASPACE

Seaspace '85 is scheduled for June 21-23 at the Shamrock Hilton Hotel, Houston, Texas. The highlight of the show will be Jack McKenney with two of his latest films. Doug Cameron will present his innovative six projector slide production, A Fiji Fantasy, and Dr. Eugenie Clark will be featured in a film premiere, *The Hurla Odyssey*, by Chuck Nicklin and Amos Nachoum.

Seminars will include SKIN DIVER's Paul Tzimoulis, photographers Carl Roessler, Paul Schutt, Dick Jacobi and Ernie Brooks, special effects photo-wizard Dickie Walls, diving scientist Dr. Bruce Bassett, wreck diving authority Peter Zwick, the Cousteau Society's Dick Murphy and many other notables. There will be more than 90 exhibits and the Houston area dive shops will offer a free intro to scuba all weekend.

The International U/W Photo Contest features a new category: underwater video, with the winning tape to be aired on Scuba World TV, with other fine prizes for the photo contest winners. Jim and Cathy Church will offer an eight hour photography seminar on Sunday, June 23.

Sponsored by Houston Underwater Club, Seaspace is a non-profit event produced entirely by volunteers. Proceeds from it are channeled into a marine-related scholarship program. Tickets will be available at all area dive shops, by mail and at the door. For further information, write Seaspace, P.O. Box 3753, Houston, TX 77253-3753.

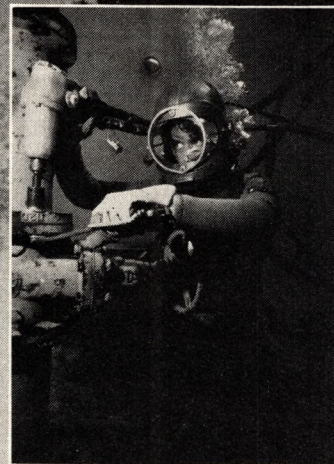
GREAT PLAINS CONVENTION

The Great Plains Diving Council will hold its 20th annual convention April 26-28 at the Ramada Inn, Kearney, NB.

Bill Lovin will be the highlight of this year's convention, with a film show and an underwater photography workshop. Lovin has worked professionally in television and film production since 1968. He has traveled around the world, shooting both above and below the ocean's surface. An accomplished still photographer, Lovin's pictures have appeared in SKIN DIVER and other publications.

Lovin will also be one of the judges for the annual underwater photography contest. For more information, contact Kearney Divers Supply, 4107 Palamino Rd., Kearney, NB 68847; (308) 237-7943.

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**FOR
DIVERS**
BY FRED BOVE, M.D., PH.D.

Recently, I had a letter from a diver who asked about headaches and nausea during a dive. The circumstances before the dive were interesting because they follow the typical course of carbon monoxide poisoning. The divers were in the enclosed cabin of a boat in cold weather, when the captain lit an alcohol stove to heat some coffee. The divers noted some fumes and didn't think much of them at the time. Following their first dive, they all had headaches and nausea that prevented diving any more that day.

This is a typical story for carbon monoxide poisoning—it can occur insidiously in the most unsuspecting circumstances.

Carbon monoxide is an odorless, colorless gas that forms when there is incomplete combustion of fuels. Everything we burn for fuel (wood, coal, oil, gas, alcohol, etc.) contains carbon and the process of burning combines the carbon with oxygen to form one of two combinations. Complete combustion produces carbon dioxide (CO₂). The reaction of oxygen with carbon to form CO₂ is one of the fundamental energy producing chemical reactions. All forms of animals use this reaction to produce metabolic energy. Anytime we burn fuel, this reaction occurs to produce energy. Incidentally, the carbon dioxide has to go somewhere. If it weren't removed from the air we would by now have an atmosphere laden with it. We are saved by the trees and plants that use the energy of the sun to convert carbon dioxide back to carbon and oxygen. The carbon becomes part of the plant structure, the oxygen is released into the air.

You can see why we are so interested in keeping our forests healthy. It is not just for looks, we need the trees to replenish the oxygen used when we burn fuels in furnaces or in our body.

When there is not enough oxygen to

completely burn the carbon in our fuels, then a different product is formed—carbon monoxide (CO). Note that only one oxygen atom is combined with one carbon atom. This small difference converts the gas from a relatively harmless one (carbon dioxide is not entirely harmless, but it is much less toxic than carbon monoxide) to a deadly, silent killer.

Unlike carbon dioxide, which is the product of combustion in the cells of the body and is handled by normal body processes, carbon monoxide adheres tightly to the hemoglobin in the blood and prevents oxygen from being carried to the body from the lungs. If the hemoglobin cannot carry oxygen, the cells and tissues essentially suffocate. CO also blocks the action of certain cell enzymes that are necessary for utilization of oxygen by the cell. When the blood vessels of the brain sense the lack of oxygen, they dilate to allow more flow into it. This causes a headache. It is likely that nausea comes from abnormal impulses originating from areas of the brain that are sensing the lack of oxygen. If allowed to continue, the buildup of CO in the brain and other body tissues ultimately causes the cells to die and the function of many of the organs of the body becomes abnormal. The heart cannot function very long without oxygen and in severe CO poisoning, death may be owing to heart stoppage. Before that happens, the brain becomes involved and unconsciousness occurs. In severe CO poisoning (for example in a house fire) once unconsciousness occurs, the victim is unlikely to survive unless rescued.

As divers, we should be concerned with CO contamination of our breathing air. Drawing exhaust fumes from an internal combustion engine into a compressor intake is a classic example of how diving air can become contaminated. After several bad experiences early in sport diving, the compressor problem is nearly gone. CO poisoning can come from other sources, however. Faulty stoves, heaters or furnaces can cause CO poisoning; burning a gas or charcoal stove or a catalytic heater in a closed space will use up the oxygen to the point that incomplete combustion will produce carbon monoxide. Car exhaust is heavily laden with carbon monoxide and situations which have caused prolonged exposure to engine exhaust have caused people to die.

If you are exposed to CO, the chances are you won't know it; many victims die in their sleep because you cannot smell, taste or see the gas.

Treatment of CO poisoning first requires removal from the source. You should get to fresh air as soon as possible. We now use hyperbaric oxygen to rapidly remove CO from the body and restore function to tissues and organs. Use of 100 percent oxygen on the surface on-

(Continued on Page 52)

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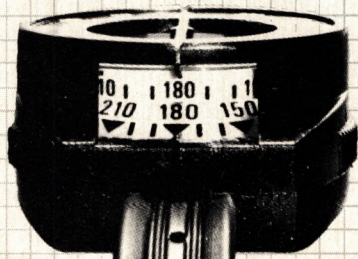
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per day, along with tanks, air, etc. And Heron's full facilities include day and night tennis, a cinema, swimming pool, well-stocked bar and dance band. Situated within a marine national park, Heron is perfect for close-up and macro underwater photography. You can also explore by glass-bottom boat, go for a reef walk, or go deep sea fishing. Would-be divers can learn at Heron's own certified diving school. There's no diving like the Great Barrier Reef, and no place on the reef like Heron Island. For information and dive brochure, call (714) 786-0119.

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
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Rx FOR DIVERS

(Continued from Page 48)


ly also speeds the rate of removal from the body.

Avoiding CO poisoning is easy. Be sure of your air supply; be sure stoves or furnaces are properly vented; do not use stoves, heaters or fires in closed spaces where you share your air supply with the fire; avoid prolonged exposure to auto exhaust; and stay out of burning buildings. You might also give up smoking cigarettes, because the burning cigarette also produces carbon monoxide, although the amounts are small and don't appear to have any obvious effects.

Knowledge about carbon monoxide sources, effects and avoidance is a necessary part of diving training. Learn as much as you can about it so that you can avoid this deadly, silent killer. 


DIVERS GUIDE TO CAPE ANN

Divers Guide to Cape Ann has been revised for the 1985 dive season. The guide is complete with a center-fold chart of Cape Ann showing 65 dive sites, which are described in the text. In addition to the dive sites chart and descriptions, the *Divers Guide to Cape Ann* lists: motels/hotels that are friendly to visiting divers; restaurants that welcome divers in their roughing it clothes; nearby air stations; dive boats; and all the rules, regulations, laws and ordinances that apply.

The *Divers Guide to Cape Ann* is available from local dive shops in the Northeast area or by writing to Fred Calhoun, P.O. Box 291, Back Bay Annex, Boston, MA 02117. 

ILLINOIS IDEA

The International Diving Educators Association (IDEA) appointed Patrick Hammer of Scuba Emporium Inc., their Northeastern representative. Hammer is well known in the area for his professional instructor training. He has been teaching scuba diving for over 10 years.

IDEA has also appointed Scuba Emporium their Midwest Instructor College. Along with their ongoing training and continuing education courses, the Emporium is adding ongoing and continuing training in scuba instruction and specialty instruction. A variety of seminars and 20 other levels of diver training are available. 

DIVER COOKBOOK

Husband and wife authors, Michael and Ann Clayville, are beginning work on a new cookbook designed especially for divers. Ann Clayville commented, "We want this cookbook to contain the recipes that American divers enjoy the most. That's why we're asking divers all over America to send us their favorite recipes."

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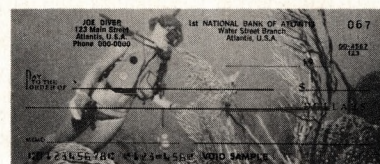
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This way, the book will be a helpful tool for divers from California to Maine and anywhere in between. Plus, when a diver sends us an appropriate recipe for the book, we will give him/her credit for it by printing his or her name, city and state along with the recipe."

Aside from recipes, the new cookbook will also contain a number of sections on how to find, catch and clean a variety of aquatic life.

The authors estimate the new cookbook will be available sometime later this year. It will initially be offered through dive shops and bookstores.

All divers are encouraged to send their favorite recipes, along with their names, addresses and phone numbers to Divers' Favorite Recipes, 13253 Verdura Ave., Downey, CA 90242. 🐟

CHURCHES TAKE A LEAVE FROM TEACHING

Jim and Cathy Church, contributing photo editors for SDM, will not be teaching their Caribbean U/W photography courses this summer. After 14 seasons, they are taking a year off to update their teaching methods; present more one-day seminars around the U.S.; expand into U/W video; lead U/W photography trips; and write more books and articles.

"The summer courses have been successful," Cathy Church stated, "but we need a rest and some time to grow professionally." The high student repeat rate in the courses is one of the reasons the Churches need time to regroup. In Jim's words, "When over half of our students have taken the course before and five students ten times or more, the need to expand our knowledge and constantly upgrade our teaching techniques is tremendous. We presently plan to offer courses in a new format in 1986."

Exclusive U/W photo trips to Truk Lagoon, Galapagos Islands, Sea of Cortez, Vanuatu and other locations are planned for 1985-86. These trips will be open only to past Church photo students. 🐟

RESEARCH SUBMERSIBLES LTD.

Research Submersibles Ltd. has signed a contract with Club Mediterranee at the Club Med Turquoise on Providenciales. The contract calls for RSL to operate the deep diving submersible, PC 1802, in an area which is regarded as having some of the most spectacular and unspoiled underwater scenery in the world. The submersible will take one pilot and four passengers to depths of 1,000 fsw for a two hour ride to explore untouched reefs. Professional submarine pilots and technicians have been recruited from the North Sea to man this operation. 🐟

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GONE DOWN LATELY?

No! Then Don't Invite A Rude Awakening—Get Prepared

BY G.A. BRANDT

I had taken plenty of time to plan for my dive trip, as it was the first in three years—owing to a change of jobs that moved me inland—and I was more than psyched up for it. Two months before the anticipated date, I was busy fussing and fiddling with my gear which had sat all but forgotten in the rear of the closet for so long. Each day as the trip drew closer, I would inspect and reinspect the O-rings, straps and seals for any sign of corrosion that might have left my underwater life support system unsound during that eternity of unuse. For some reason, I found it especially fun to drag it all out and do this while watching old reruns of *Sea Hunt*. While my gear attained better than new condition, the diver who would soon be using it was still rusty.

In the back of my mind, I was well aware of the need to refresh myself in the pool on some basic procedures and refa-

miliarize myself with my gear. I had given this advice to other divers I knew who weren't able to dive at least once a month and I had always preached that a safe diver is one who dives often. As time grew shorter, however, I allowed myself to put it off, half believing I was the exception. After all, I had logged over 80 dives, assisted numerous classes and been a member of the local recovery unit for nearly two years. Once an expert, always an expert and it would all come back to me the minute I hit the water.

When I finally found myself on the boat heading for my favorite old dive site, I became even more confident. The old wet-suit didn't fit the same, but it still went on one arm and one leg at a time. The snorkel still went on the left side, the regulator on the right. Ah yes, I thought. I've still got my old finesse.

I had a rude awakening only minutes

into my first dive, when my tank slipped out of the backpack and almost tore my regulator from my mouth. I was swimming along the sheer face of a canyon wall, which descended 90 feet before it shelved off to any extent. My first hope was to grab a small outcropping of coral and wait for my buddy to rescue me, but I watched him swim out of sight without a backward glance. A strong current wasn't making matters any easier, so my only choice was to follow the wall down until I could find a flat surface to rest on. I was able to find a tiny ledge at about 60 feet and with the current still present and poor visibility adding to the challenge, I set about removing, reassembling and replacing my equipment underwater. It occurred to me I hadn't practiced a ditch and don exercise in over three years. My mind knew what to do, but my reactions were sluggish and it is the reactions

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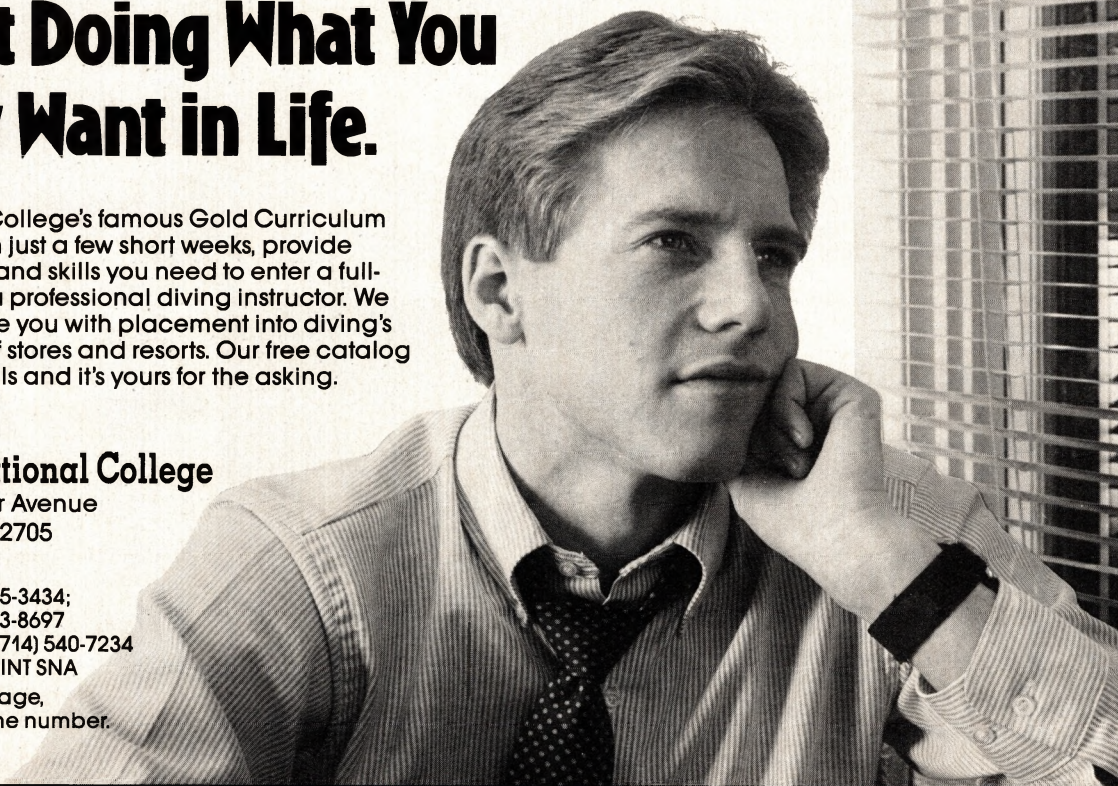
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that save one's life in an emergency.

Getting the backpack off so I could put the tank back in place was easy, compared to what came next. I wasn't at all accustomed to working while wearing neoprene gloves, so my dexterity wasn't what it could have been. Finally, I got the whole deal put back together. Now came the work of putting it back on amid the cloud of silt I had raised.

I had the tank on and everything seemed fine, when I noticed my octopus hose was running underneath the waist strap of my backpack. I promptly reached down and unfastened what I thought was the waist strap—and felt my weightbelt slip off. I managed to grab it by the buckle end, only to see a weight fall off before I could recover the other end. With a full one-quarter inch wetsuit on, I was, needless to say, in a bit of an awkward position, hanging upside down and struggling to keep from ascending.

I was able to put the weightbelt back on and get oriented, but by now I had used nearly half my air. I contemplated following the wall down to search for the missing weight, but decided I had made enough mistakes for one day without adding a decompression dive to the list. I ascended and swam back to the boat. After explaining, with as few details as possible, how my buddy and I had become separated, I went below and broke out my dive manual. I spent the rest of the day quietly reflecting on my mistakes,

definitely feeling humble.

I thought it over and came up with a list of exercises to practice in the pool next time I've gone a while without diving. This is a personal list and I'm sure there is much that could be added to it, but it includes a few ideas as follows:

(1) Practice the exercises you were taught in your basic class, such as: Completely remove all your equipment underwater and put it back on likewise.

(2) Practice buddy breathing with a partner, with and without an octopus.

(3) If nothing else, just spend time in the pool getting reacquainted with your equipment and get used to breathing underwater again.


(4) Outside the pool, sit down and study the dive tables, until you are once again familiar with them. Look over the notes, if you have any, from your basic class and see what you can find there that might be helpful. Think back on those little rules of thumb that are passed on from experience and should not be forgotten, such as: Keep your waist strap and weightbelt fastening in opposite directions, so as to avoid confusion between the two.

(5) Finally, keep in mind that while buddy diving should be practiced, you can't always rely on a buddy to bail you out of trouble. Develop a certain amount of self-reliance so you can look after your buddy as well as yourself.

How long has it been since you last

went diving? It doesn't have to be three years and according to all the major diving schools, you are out of date if it's been a month. Many divers, especially the ones who live inland, dive only on their vacations once a year. If you live in the same area in which you were certified, you might contact the instructor who taught you and ask him/her if you could sit in on classroom sessions. Any instructor worth his/her salt will happily oblige. You might also consider taking a refresher course. These usually are two class and two pool sessions and range from \$35-\$45, depending on the instructor.

If you were certified in the late '60s or early '70s or if you were a diver in the Navy and would now like to get reinvolved in the sport, you may consider taking the basic course again, starting from scratch. Much has changed in the industry—the equipment has been refined and redesigned and there are a couple of items you may be totally unfamiliar with, such as a buoyancy compensator and octopus, or safe second stage. Safety techniques are being taught that weren't heard of 15 years ago and all these things have made diving a safer, more enjoyable sport.

For more information consult your local dive shop or write to one of the national certifying agencies whose addresses are contained in advertisements in this magazine. Most offer refresher courses and can refer you to one in your area. 

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1985 SPRING SHOPPER'S GUIDE

The products listed in Shopper's Guide are those which the editors feel are of interest to readers. All specifications and claims are supplied by the manufacturers or sellers, who bear responsibility for their accuracy. It is impossible for SKIN DIVER to obtain samples of all products listed for evaluation and verification of manufacturer's claims. This listing is provided as a free service and vendors of U/W equipment are invited to submit information and black and white photos for consideration.

DISC UNDERWATER PHOTOGRAPHY



ikelite

By Gale Livers

1 Disc Camera Guide—*Disc Underwater Photography*, written by Gale Livers, is a 44 page "how to" book on using disc cameras in underwater housings. Eighteen color photos taken with disc cameras, combined with step-by-step directions, guide the user to hassle free snapshot photography. \$5.95, Ikelite.



2

2 Dive Mask/Optical Lenses—The Futura dive mask from Scubapro can now be fitted with corrective lenses. The optics are ground into the tempered glass lenses, available in one-half diopter increments from - 1.0 to - 6.0. For either eye, \$25 each. The mask is \$24 in black neoprene and \$49 in clear silicone.



3



4



5

3 Doll Wetsuit—For the diver/doll owner of discriminating taste (or who has everything), Body Glove now offers a complete line of neoprene apparel to fit most medium size dolls. A wide variety of prints and colors is available. \$17.95. From Dive n' Surf, Inc., 504 N. Broadway, Redondo Beach, CA 90277.

4 Designer Bag—The Whale Bag is available in burgundy with gray trim or sea blue with white trim. It offers 1.25 cubic feet of storage space and is made of 11 ounce Cordura nylon, 1/4 inch foam liner, oversize zippers, removable saddle bag, double handle and shoulder straps. \$59.95. From The Creative Whale.

5 Helmet Exhaust System—Diving Systems International now offers a double exhaust system for its SuperLite-17 helmet. The exhaust mechanism helps to prevent leakage of contaminants into the diver's helmet and has been used by NOAA in polluted environments. The double exhaust system is \$96 from DSI.

SDM SPECIAL SERIES ON REGULATORS

IDI



SUPER STAR II

TEXT AND PHOTOGRAPHY BY GEORGE COZENS

It was early 1982 when I first heard of International Divers Inc., and of their new regulator that had just come on the market. Although IDI and its earlier relative, Kaiser Continental, had been making diving equipment for many years, the company was not exactly a buzz word in diving circles—its products were sold under other, more publicized names. With the Scuba Star II, IDI came out with its own line of diving equipment. The Star II proved to be an excellent regulator. But there shouldn't have been any doubt as to its quality and performance: It was an upgraded, direct descendant of the Scubamaster. This latter regulator was tested by the U.S. Navy in 1979 and found to be among the seven (of 36 tested) in the high performance category. My evaluation of the Star II appeared in the May 1982 issue of SDM. I was very favorably impressed with it then. And, in the intervening years, with the additional experi-

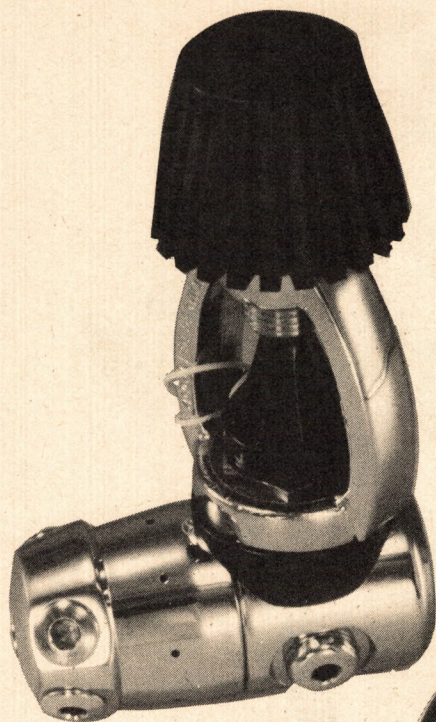
ence of several dozen dives, my initial impression has not changed. The Scuba Star II has performed well under widely varying conditions.

Making its debut this year at the 1985 DEMA Show, the Super Star II exhibits many of the same features of the Scuba Star II. In addition it has some modifications that should prove to make it even better in the areas of performance, reliability and low maintenance.

The Super Star II, like the Scuba Star II, utilizes a balanced, flow-through piston design in the first stage. The surface area of this oversized, stainless steel piston is about 28 percent greater than that of a typical piston, giving it increased sensitivity to changes in ambient pressure. For improved air delivery to the second stage, the air passage in this piston's stem has about twice the area of one on a more standard piston. The piston orifice seals against a polypropylene high pres-

sure seat. Polypropylene is more durable than the commonly used Teflon® and has better seating/sealing characteristics for more uniform performance and less high pressure leakage. Additionally, this high pressure seat is easily adjustable, externally, by any trained technician. The body of the first stage is machined from solid brass, while the 4,000 psi rated, swivel yoke is forged from brass. Both are protected with a heavy chrome plating.

The Super and Scuba Star II first stages both offer: a large plastic knurled yoke screw; a solid, O-ring sealed dust cap; two high pressure ports, with 7/16 inch threaded connections; and a stationary low pressure block, modified since the earlier version for increased protection from the environment. This low pressure block provides four 3/8 inch, low pressure ports spaced strategically around the circumference of the stage. Appropriate selection of the low pressure



The Super Star II first stage (above) features two high pressure ports threaded for 7/16 inch connections. Four low pressure ports fit 3/8 inch connections. The second stage has a mouthpiece, diaphragm cover and exhaust tee of silicone rubber, available in blue, yellow and clear.




lence. The chrome plated brass downstream demand valve in each is coupled to an aspiration tube, which directs some of the air toward the mouthpiece tube, further decreasing air turbulence, quickening the delivery time and creating a slight venturi action which reduces the inhalation effort. This demand valve is easily adjusted with only simple tools and brief training. The valve's low pressure seat is neoprene. The demand valve lever is stainless steel, tipped with a Teflon button, to reduce friction where it contacts the back side of the silicone rubber diaphragm. A plastic quick-release, clip ring secures the diaphragm and its cover in place, yet it can be easily removed with a flat blade screwdriver to gain access to the interior whenever needed. Silicone

mal. As an example of the attention paid to detail, all O-rings in it are made of Buna rubber, known for its long life and sealing performance. In addition, the extensive use of silicone rubber in the second stage components should make this a very low maintenance regulator. Silicone rubber has a greater resistance to ozone in polluted air and to chlorine in swimming pools. It has the added advantage of being hypoallergenic.

As with any good regulator, professional service is suggested annually. Typically, the cost for parts might range up to \$5 for items replaced annually and perhaps \$10 to \$12 more for parts that need less frequent replacement (e.g., high pressure seat, diaphragm and mouthpiece). Depending on the need for service, labor might run between \$5 and \$15. IDI covers all internal moving parts in its regulators with a limited lifetime guarantee transferable to any owner.

For my evaluation dive with the Super Star II, I again returned to the dive charter boat, *Scuba Queen*, out of 22nd Street Landing, San Pedro, CA. A series of four dives were made on the front side of Catalina Island, with depths to 100 feet. With my breathing pattern varying from very slight to grossly exaggerated, the Super Star II performed beautifully. Inhalation and exhalation resistances were remarkably low and closely tracked my comparison regulator (also a member of the high performance category in the 1979 U.S. Navy test) Even at depth, I couldn't out breathe the Super Star II. Freeflowing was normal for an easy breathing regulator: With the mouthpiece turned up and the stage full of air, or the purge depressed, freeflowing would start—but this would stop once the mouthpiece was turned down. Freeflowing was self-stopping in other positions. In making the rounds of my usual contorted orientations, no abnormal behavior was noted. Only when in the strange position of lying on my back with my head tilted far back, did I notice any water leakage and this was minor. Overall, the Super Star II performed very well, with, perhaps, only one idiosyncrasy: When making very forceful inhalations, I could get the regulator to stutter a little. This was not observed during normal, or even moderately exaggerated inhalations, only when my inspiration was really forced.

IDI's Super Star II retails for \$238. At this moderate price, with low maintenance, an excellent warranty and the high performance I experienced, I would certainly recommend the Super Star II for any diver's consideration. Test dive this regulator, you'll be pleasantly impressed. 

ports for hose connections can reduce or eliminate the need for a swivel block; resulting in fewer moving parts and one less air flow restriction in the first stage.

In addition, the new Super Star II has three more features to further improve performance in the first stage. A new, cone shaped, high pressure inlet filter has a greater surface area and finer porosity, providing better filtration of the air and increased air flow with less susceptibility to clogging. A fifth low pressure port was added to the end of the Super's low pressure block: This arrangement provides a more efficient path for air going to the primary second stage. The third feature is a new intermediate pressure, larger diameter hose, capable of a greater flow of air with less resistance.

The second stages of the Super and Scuba Star II are almost identical. Both use a chrome plated brass case having a smooth interior for reduced air turbu-

lence. The chrome plated brass downstream demand valve in each is coupled to an aspiration tube, which directs some of the air toward the mouthpiece tube, further decreasing air turbulence, quickening the delivery time and creating a slight venturi action which reduces the inhalation effort. This demand valve is easily adjusted with only simple tools and brief training. The valve's low pressure seat is neoprene. The demand valve lever is stainless steel, tipped with a Teflon button, to reduce friction where it contacts the back side of the silicone rubber diaphragm. A plastic quick-release, clip ring secures the diaphragm and its cover in place, yet it can be easily removed with a flat blade screwdriver to gain access to the interior whenever needed. Silicone

rubber is also used in the exhaust valve. A small hinged weight, positioned just behind the exhaust valve, helps eliminate water leakage and freeflowing when the regulator is upside down, but swings free of the valve when the regulator is in more normal positions. Differences in the Scuba Star II and Super Star II second stages involve the materials used in the mouthpiece, diaphragm cover and screw-mounted exhaust tee. In the Super Star, all three of these components are silicone rubber, available in light blue, yellow and clear. On both second stage models, it should be noted, the diaphragm cover is flexible. Containing a one and one-eighth inch diameter stainless steel disk, which serves as the purge button, this cover can take a lot of abuse.

Considering the basic design and use of non-corrodible materials, maintenance of the Super Star II should be very mini-

THE NIKONOS SB-103

A Sub-Compact Strobe
That Does Everything



TEXT AND PHOTOGRAPHY BY GERI MURPHY

Finally, Nikon has developed a sub-compact underwater strobe—and it's a honey! The company has traditionally built large, powerful underwater strobes for the Nikonos. First, there was the SB-101 for the Nikonos IV-A, then an even larger SB-102 for the new Nikonos V. These had all the electronic bells and whistles, but were hefty and expensive.

Meanwhile, two or three other manufacturers developed neat little mini-strobes that worked fine with the Nikonos and produced good macro shots and fish close-ups. It seemed as if Nikon was missing the boat—but not for long.

Now, in a surprise change in marketing strategy, the Japanese giant of camera making has produced its own version of the sub-compact. The big difference is this little strobe offers many of the unique features of the larger Nikon versions but for much less.

The SB-103 is small, lightweight, powerful, fully TTL and has four different power settings. It will work with any Nikonos lens, including the 15 mm.

FIRST GLANCE

Upon opening the package, one is immediately charmed by this little strobe. It is a bright orange-red with a black anodized flash arm and accessories.

Also very impressive is the instruction manual. It is by far the best such document ever produced for any Nikonos product. The basic operation of the strobe is explained in a step-by-step manner with each clearly numbered and illustrated with good photos. There are also tips on using flash, battery performance, strobe maintenance and fill-in flash with the TTL feature. This manual will definitely help you produce better pictures.

Another neat goodie which comes with the SB-103 is a plasticized Exposure Calculation Chart. This unique flash aid allows the user to quickly calculate f stop or distance through the clever combination of a chart and bar graph. The chart works for seven different film speeds from ASA/ISO 25 to 1600. Distances are marked off in feet and meters. Flash ranges cover all four power modes from

1/16 to full, plus automatic. The Exposure Calculator has an adhesive backing and can be placed on the flash head.

BASIC DESIGN

The SB-103 was developed for the diver who wants to move fast and shoot a lot of pictures with a minimum of hassle. And, the Nikon engineers have achieved this goal without sacrificing any power.

The little strobe is definitely compact, measuring only three and three-quarter inches in diameter and seven inches long. Its compact size reduces underwater drag greatly and makes it highly maneuverable for grab shots.

The SB-103 weighs barely two and one-half pounds out of the water and is almost neutral underwater. What a relief! You don't feel like you're dragging the *Titanic* around the seafloor! It is powered by four AA batteries, which can be purchased almost anywhere (even in the islands). A set of fresh alkalines will provide 130 flashes, while a set of fully recharged ni-cads will give 50. Nikon rec-

ommends using ni-cads for faster recycle times and higher efficiency in cold water.

The SB-103 is ruggedly built of high impact thermoplastics and every joint is O-ring sealed. Nikon guarantees the strobe to an operating depth of 160 feet and we suspect it could go deeper.

Inside, the SB-103 contains the latest in electronics. It's a neat little package of series circuitry with a silicon-controlled rectifier. This little unit squeezes a lot of power out of those four AA batteries and performs some miracles along the way.

First of all, the SB-103 electronics pro-

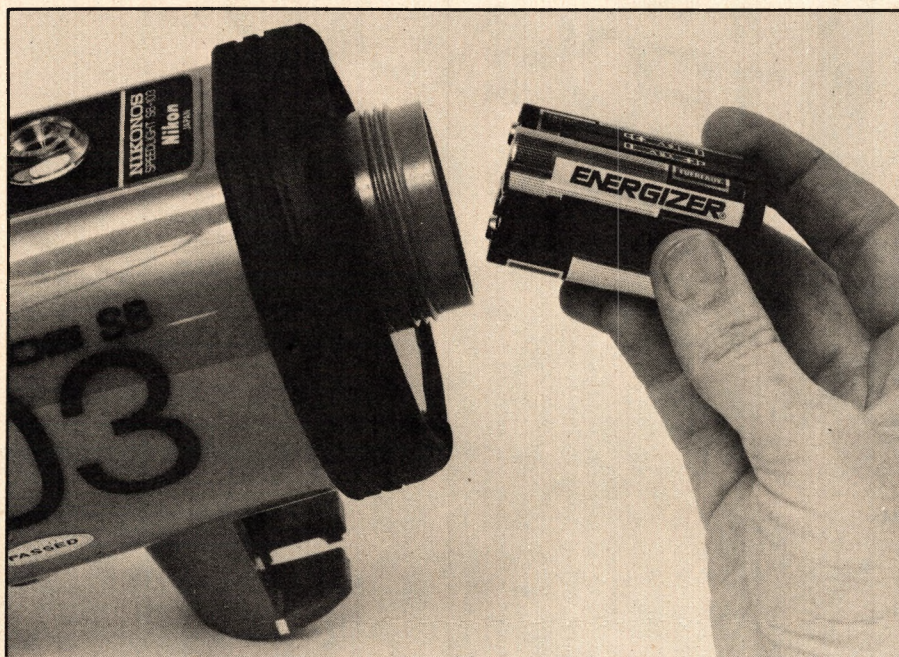
in flash when the photographer wants just a hint of light in the shadowed areas. It works especially well in close.

How about flash angle? The SB-103 is a champ. The primary angle of flash coverage is a rectangular pattern measuring 70 x 53 degrees on land. It will fully cover the Nikonos 35 mm lens (land/underwater), the 28 mm underwater lens or the new 28 mm land lens. A Wide-Flash Adaptor (SW-103) can be quickly snapped over the front of the flash head, thus providing corner-to-corner flash coverage for the wide angle 15 mm lens. No

new right-angle fitting that protects it from accidental pinching and breakage.

PERFORMANCE

How does the SB-103 perform? Like a charm. This little strobe does just about everything needed in flash photography. You can hardly go wrong with it. And, now I've used it a few times, I'm ready for duals. You heard me right. Nikon has produced some interesting accessories for this flash, including a Double Flash Bracket, a Double Sync Cord and an Extension Arm for longer reach. For the first



vides full TTL operation with the Nikonos V. The U/W photographer can achieve perfectly exposed flash pictures every time, without having to readjust the f stop after the initial setting. An automatic sensor behind the camera lens is responsible for the perfect exposures. That's why it's called Through-The-Lens (TTL).

Does it really work? You bet! The only hitch is the SB-103's TTL circuit only works with the Nikonos V camera. If you don't have this model, buy one: The TTL feature alone is worth it.

If you have an older Nikonos and cannot afford another, don't despair. The SB-103 will operate just fine with a Nikonos IV-A or III. There are three additional power modes for manual flash operation. On Full Power the strobe has a guide number of 66 (feet) with ASA/ISO 100 film.

The 1/4 Power setting is great for macro photography since it greatly stretches the number of flashes per set of batteries. Full power is really not necessary at these ultra-close macro distances.

The 1/16 Power is quite helpful for fill-

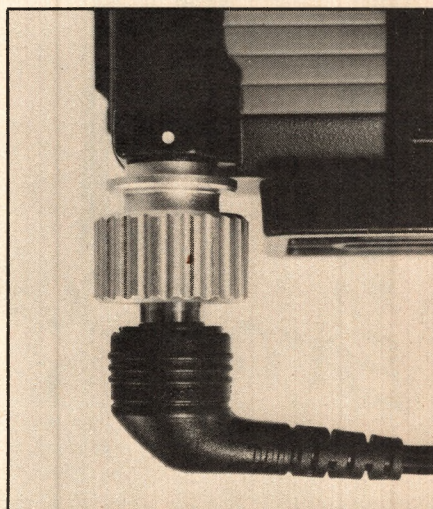
matter the lens, the SB-103 covers it.

FLASH ARM AND BRACKET

Could there possibly be more? Oh, yes. The SB-103 features a radically new flash arm. It's simple, compact and highly maneuverable. The flash arm bracket mounts onto the bottom of the camera and is separate from the arm. This feature makes it easier to handle the camera during film loading. It is also easier to pack.

The arm is a bent angle rod that easily and quickly attaches to the bracket by a threaded anchor knob. The flash head mounts on the upper end by means of a multi-position bracket. This allows the flash head to rotate in two separate directions and slide up and down the flash arm as well. The end result is that you can place the flash head just about anywhere you choose.

Another fine touch is the flash sync cord. It can be unscrewed from both the camera and the flash head for safe packing. Both ends have O-ring seals. The end which fits into the camera features a



The SB-103 uses four AA cells. It can be operated in TTL mode as well as manual Full, 1/4 and 1/16 power. Sync cord has an L-shaped attachment.



time ever, you can hook up two SB-103 strobes on one camera for multiple flash photography with TTL automatic exposure. It should be a blast!

For more information and prices, see your local authorized Nikonos dealer or contact Nikon Inc., 623 Stewart Avenue, Garden City, New York 11530. >

FIT

FLORIDA INSTITUTE OF TECHNOLOGY

Earn A College Degree in Diving

Try registering at most colleges for this class schedule and degree program: First period: seamanship, boat handling and work toward your captain's license. Second period: underwater photography in a lab fully equipped with top quality still and video equipment. Third period: dive instructor certification. Fourth period: retail dive store accounting, nautical science, life-saving or oceanography.

See if you can choose from these electives: emergency medical technician (EMT); outboard engine or compressor maintenance; recompression chamber operation; celestial and electronic navigation; or marine communications. Ask if there is a campus on the Florida east coast so you can do your field research in the crystal clear Gulf Stream near the Palm Beaches. If it sounds like a university you could only dream about, it isn't! The only one of its kind, it's Florida Institute of Technology's (FIT) Sport Diving Operations degree program and you could enroll next semester. Two years later you could walk up to receive your Associate of Science degree and turn away prepared to make a career out of the business of diving.

Instead of being a short term dive college, FIT is an accredited university on the Indian River at Jensen Beach, Florida, just 45 minutes north of West Palm Beach. It has a very tropical flair; a rolling hill campus, tall palm trees, nearly year-round warm weather and a waterfront setting. All the buildings, including the 550 foot long dock, are designed to en-



hance a student's marine science educational goals.

As division director Drew Richardson showed me around the campus, he explained the uniqueness of this degree program. Nowhere else in North America, perhaps the world, can students receive such intensive instruction in all aspects of sport diving as a business. The university has its own fleet of dive research vessels; a 20 foot deep training tank; a 75 foot long pool; a triple lock recompression chamber; high pressure compressors; top quality underwater and land photographic equipment complete with a total photo lab; a complete outboard engine lab; and a very comfortable

classroom and living environment.

Richardson explained that most of the people who enroll are already certified in scuba. Every student is taken through a six quarter program that includes the following classes: intermediate diving, advanced diving, divemaster and assistant instructor. Along the way students pick up valuable additional training in advanced first aid, advanced lifesaving, diving physiology and scuba equipment repair. At the completion, each graduate receives dive instructor certification.

Since some of the students will eventually end up working at or owning dive resorts or retail dive stores, a great deal of training in retail business and accounting

procedures, as they apply to dive merchandising, is given. More conventional college classes are not ignored either. The program includes English and algebra alongside practical marine courses such as boat repair and maintenance, welding, navigation, rules of the road, basic mechanics, motor boat operations and several levels of oceanography.

The labs are fully stocked with the latest equipment. Near the training pools, the dive locker also houses the underwater photo equipment storage area. Students are assigned a Nikonos, strobe, various lenses, adapters and extension tubes. In both classroom and open water sessions, they are taught to take quality underwater photos, as well as instruct future students in the same techniques.

In a separate building, students are taught to process slide film and make enlargements or elaborate audio/visual productions. A complete E-6 lab, dark-rooms, multi-projection studio and video classroom are available to students.

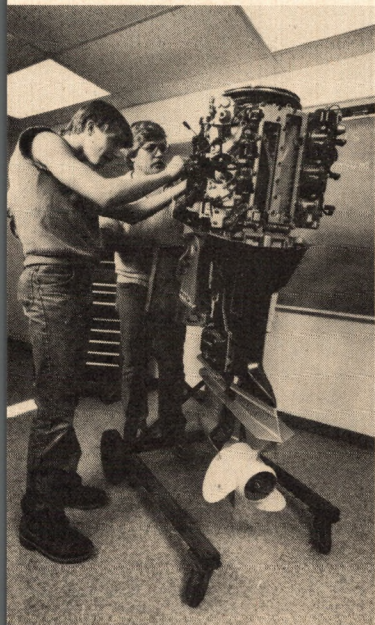
The outboard lab is equipped with a large quantity of late model Johnson and Evinrude engines. Students are taught to disassemble and reassemble each as well as trouble shoot for repair problems. Nearby, a diesel lab prepares students to work on larger boat engines. The skills learned here, along with training in air compressor maintenance and repair, may later prove invaluable.

Boating navigational skills, preparation for a U.S. Coast Guard captain's license and open water dive practices, are taught on one of the university's boats. In addition to smaller craft, FIT maintains a 65 foot research vessel and a 50 foot vessel converted for scuba operations. Within 45 minutes of the dock the Palm Beach reef systems provide depths ranging from very shallow to well over 100 feet. A large variety of marine organisms and fish flourish along this coastline. They provide students with one of the world's largest marine study classrooms.

The Sport Diving Operations program can be a means to an end or just a beginning. The classwork is structured so students may graduate with a two year Associate of Science degree or continue on in one of several four year programs to earn a Bachelor of Science in oceanographic or marine technology or other major fields of interest. At the same time, students may elect to gain additional credits in the field of underwater technology and eventually seek a career as a commercial diver.

FIT has prepared a color brochure and catalogue with more information about the Sport Diving Operations program. A copy can be obtained by writing: Director of Admissions, Florida Institute of Technology, Jensen Beach Campus, 1707 NE Indian River Dr., Jensen Beach, FL 33457. Or call toll free: (800) 241-7826; in Florida (800) 433-0116.

TEXT AND PHOTOGRAPHY BY STEVE LUCAS

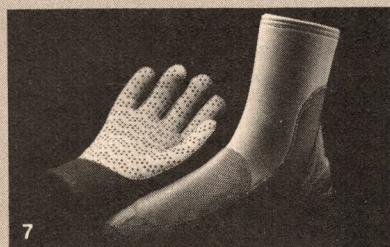


Florida Institute of Technology offers a two year Associate of Science degree in Sport Diving Operations. Courses include scuba training from intermediate diver through instructor, plus training in retail business and accounting. The program includes English, algebra and practical marine courses such as boat repair and navigational skills. Some elective courses are: emergency medical technician, outboard engine maintenance, celestial navigation and marine communications.

1985 SPRING SHOPPER'S GUIDE



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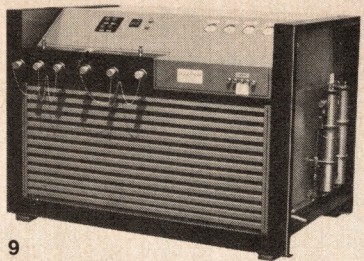


8

6 Compact Light—Dacor offers an underwater handlight that measures only 5 1/2 inches in length. It will easily fit in most BC pockets. Ideal for divers and other outdoorsmen who need a water resistant light, it has a twist on/off mechanism and is powered by two AA cells. A wrist lanyard is provided. \$10.95.

7 Wetsuit Accessories—SeaQuest is offering gloves and booties made of Ultraflex neoprene with tough nylon outside and plush inside. Five finger gloves (\$30) are 3 mm thick and three finger mitts (\$31) are 6.5 mm. Booties come in 6.5 mm (\$55, navy/royal—\$47, black/charcoal) and 5 mm (\$52, \$45).

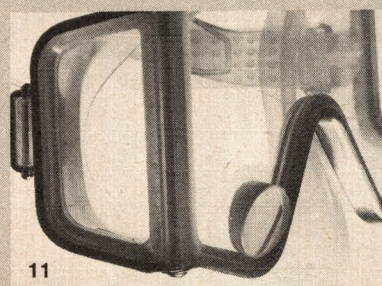
8 Large Gear Bag—The main compartment of the Scubapro Jumbo Gear Bag measures 14 x 28 x 9 inches. An additional side panel holds dive fins. Two zippered side compartments measure 10 x 10 x 2 inches each. The bag is made of heavy nylon with a water repellent coating on the inside. Nylon zippers. \$55.



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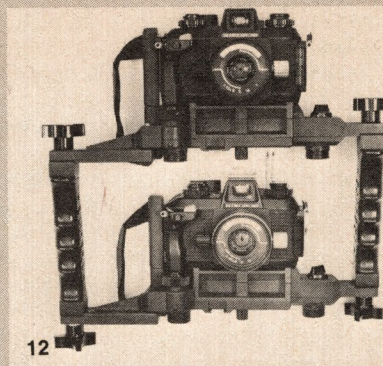


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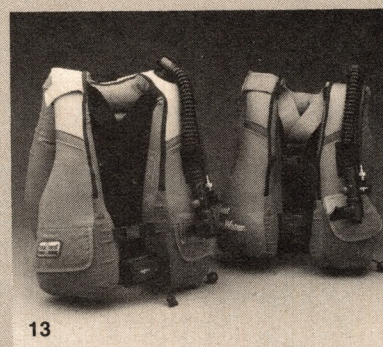
9 Air Compressor—The Poseidon P 800 is a four stage, air cooled compressor offering pressures from 3,200 to 5,000 psi at speeds from 19.5 to 32 cfm. Model 40E has a 25 hp electric motor delivering 1,300 rpm. Positive oil pressure, combined turbulence lubrication, roller and needle bearings. \$19,500.

10 Silicone Protectants—Silicone protectants for rubber and other water-sports equipment including wetsuits, dry-suit seals, zippers, camera O-rings, etc., are available in spray and grease form. The 16 fluid ounce spray can (\$5.95) contains no fluorocarbons. 1.5 ounce can of grease is also \$5.95. McNett.

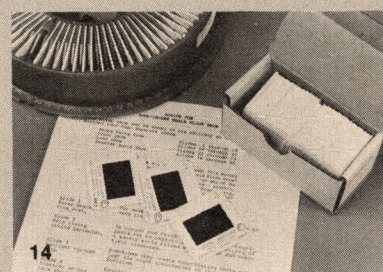
11 Magnifying Lens—Designed to attach to the faceplate of a dive mask, the Power-Sight is a plano-convex lens with a prism base for distortion free, 10 power magnification. Perfect for easy reading of gauges, dive tables, etc. Optical quality glass, \$30. Power-Sight, 394 South Street, Rochester, MI 48063.



12



13



14

12 Camera Stacking Kit—The Duplex Kit from Ikelite allows the stacking of two Nikonos, Sea & Sea Marine 35 or Hanimex 35 mm Amphibian cameras. This allows the use of two cameras fitted with different lenses. Two Ikelite consoles or two Universal Trays mount one above the other with the kit. Kit is \$19.95.

13 BC Jackets—SeaQuest has introduced a new medium version of its Open Water BC jacket. Like the large version, it features an expandable pocket, gauge and hose retainers, Rapid Exhaust Valve, power inflator and backpack. Medium offers 38 pounds of buoyancy. With CO₂ inflator, \$260. Without CO₂, \$247.

14 Instructional Slide Show—The Creative Whale now offers a four-in-one slide show to answer questions about U/W photography. The show is divided into sections: photo facts (18 slides), color (12 slides), lenses (43 slides) and strobe synchronization (7 slides). Slides are numbered and come with script. \$95.

SDM travel

SECTION

How can a group of divers dive a spectacular reef in the southern Bahamas one afternoon; drop off a 5,000 foot wall 70 miles north the next morning; swim through the same shipwreck Brooke Shields did in TV's *Wet Gold* before lunch; marvel at the new coral framing the old *Thunderball* movie set that afternoon; explore two more reefs and make a shipwreck night dive before reaching port in time to enjoy Nassau's nightlife?

The answer is Blackbeard's pair of matched 65 foot, custom built, Miami based sailing sloops, *Sea Explorer* and *Morning Star*, equipped for dive cruising year-round in the Bahamas.

Skipped by Blackbeard veteran, Bill Sang, *Sea Explorer* performed the above feat with me on a winter cruise, but her sistership, under the equally adroit handling of Captain Mark Barrett, could have pulled off the same thing. Both vessels are so cleverly designed for diving that you don't even see your tank or stowed gear until needed, then everything is readily available. Dive sites—whether a wall, a reef or a shipwreck—are often right under your boat. Step off and you're there. Climb the folding stern ladder and you're aboard again. The dive-master removes your tank and logs you in, you stow your gear in a seat locker, then everyone sails off to another dive site.

Between dives you might stretch out on the foredeck to catch a few rays or go below to rest in your air-conditioned berth. Maybe you'd like to help steer the boat; the crew is always willing. Or perhaps you'd rather kick back in the shade of the mainsail and quaff a cool brew from the conveniently located tap. Whichever you choose, it won't take you long to decide that this

BLACKBEARD'S CRUISES

Bahamas Odyssey

TEXT AND PHOTOGRAPHY
BY ROBERT F. BURGESS



is a super way to combine diving, sailing, beachcombing and partying in the Bahama Islands in one neat package.

My first sample of Blackbeard's Bahamas began one July afternoon when I boarded *Morning Star* in Miami with 22 others. Another 22 divers boarded *Sea Explorer*. All were members of Central Florida Pleasure Divers, a non-profit club based in Orlando that was begun seven years ago by

Gerald Goodson and friends to stimulate more interest in their sport.

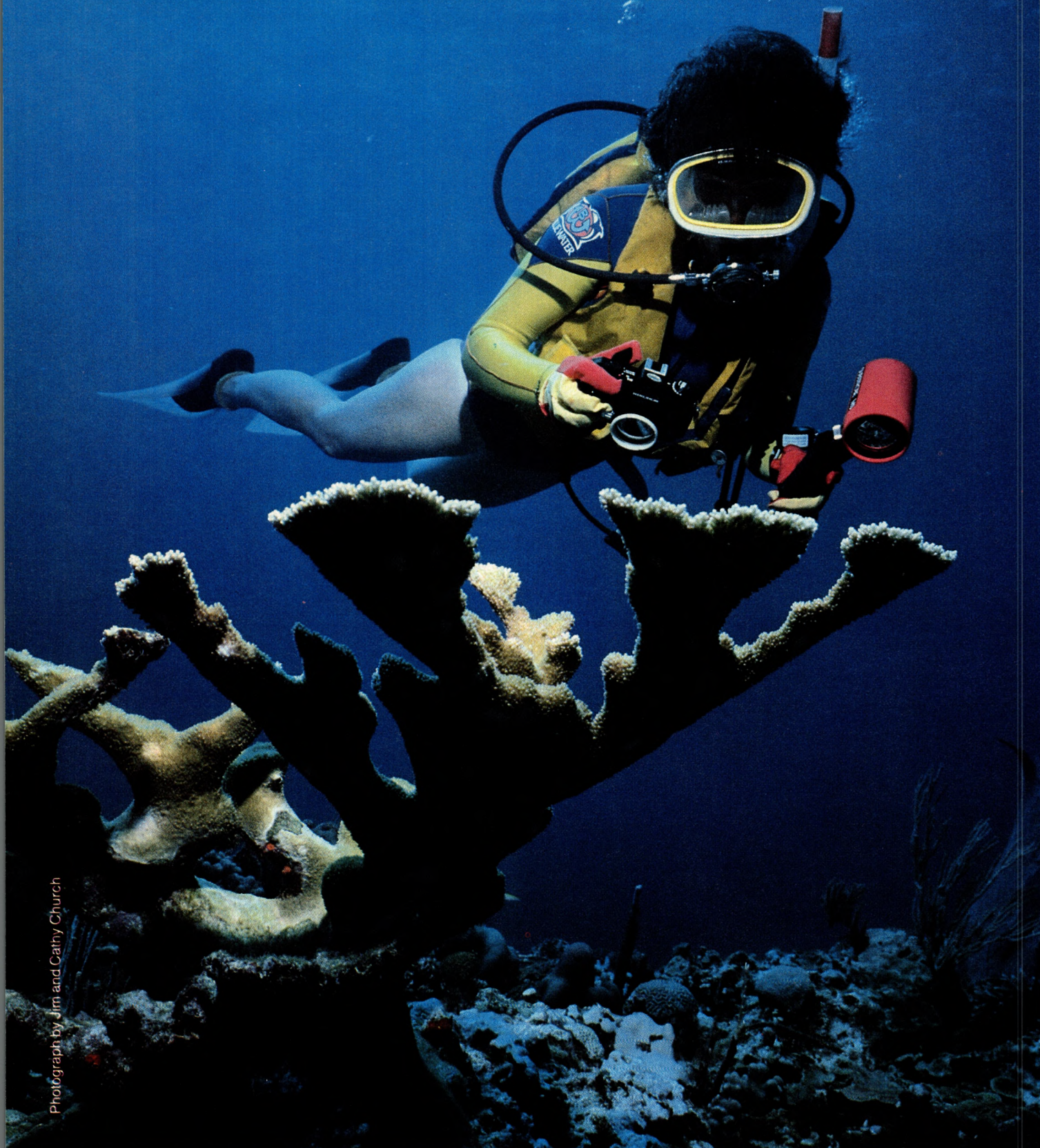
Anyone shy about joining the festivities that night quickly lost that feeling as *Morning Star* and *Sea Explorer* sizzled through the sequined seas under full moon and sail. To the strumming of halyards and the music of *Margartaville* we hoisted frosted mugs of rum punch to toast the sea, the moon and all the elements that were clearly forecasting a whopping week of good diving ahead.

Our destination was the Berry Islands, a chain of some 30 large cays and numerous islets along the northeastern edge of the Great Bahama Bank. Sailing 16 hours, we crossed



the Gulf Stream and some 70 miles of the bank to reach the southernmost island in the group, Chub Cay. Our welcome morning, get wet dive was just offshore at Sea Gardens, a colorful cluster of coral heads and seafans that started at 16 feet and descended to 40 foot depths. It was populated with the usual colorful crowd of parrotfish, grunts and gray angelfish.

Chub Cay's cobalt blue sky was



Photograph by Jim and Cathy Church

A fantastic variety of excellent dive sites by day. A fantastic variety of restaurants and clubs by night. For additional information, write to the United States Virgin Islands Division of Tourism, P.O. Box 471269, Miami, FL 33147.

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travel

ablaze with the red and orange blossoms of royal poinciana trees in full bloom. After refueling and clearing customs, everyone had a chance to sightsee the small island.

In the next week we sailed slowly up the chain of cays comprising the Berry Islands, diving up to four or five times a day on different reefs. South of Whale Cay, while exploring a low profile reef sloping off to 80 feet, we found Nassau groupers acting tame enough to hand feed. One big fellow followed us around the reef like a friendly St. Bernard. When we stopped to make friends with him, he hid shyly behind a seafan. When we ignored him, he boldly convoyed us all around the reef.

Off the southeastern edge of Bond Cay we dived some house-sized coral heads sitting like underwater islands on a plateau of white sand. Night diving this site we saw large spiny lobsters watching us from stony balconies. Each head had miniature caves and fissures wide enough to enable us to work our way up through these coral corridors to emerge in a forest of giant orange elkhorn coral close to the surface.

Each dive was a new adventure. One afternoon off Hoffman Cay we motored ashore to beachcomb. The untracked white coral sand was littered with rose-hued queen conch shells and giant brown cushion starfish up to 18 inches wide. Climbing a rocky trail through the undergrowth brought us inland to a 300 foot wide bluehole. Free-diving its brackish water we saw a few crabs and thousands of wafer-thin bivalves, three inches long, massed on the vertical walls of this strange, deep pool.

When *Sea Explorer* joined us at our evening anchorage between Hoffman and Devils Cay, it was excuse enough for everyone to move onto another deserted island around a roaring driftwood fire for a big beach party.

On our way home at the end of the week our last dive topped off everything. Near South Cat Cay we dived The Nodules, two deep coral mounds that thrust up in 70 feet of water. Beyond them a vertical wall drops off into 2,400 foot depths. Like slow-motion



Above left: Judith Opoliner with pillar coral. Top right: *Sea Explorer* and *Morning Star* at Chub Cay. Above right: Easy boarding at the stern of *Morning Star*.



sky divers we descended through water so intensely blue it was almost luminous. At 100 feet, the color changed from electric blue to deep purple. Our bubbles tinkled and clattered musically as they hurried toward the mirrored surface far overhead.

Could Blackbeard's winter cruise equal this? I wondered.


Last December I sampled it to find out. Our week of diving and beachcombing started from Nassau and took in reefs, walls and shipwrecks from Andros Island to the Exumas and back to New Providence again aboard the *Sea Explorer*. The water was 75°F, cool enough to make a wetsuit jacket feel comfortable. The weather was like early summer with daytime temperatures in the high 70s. Our diving adventures were just as fine as those in the summer.

Cruising southward farther than *Sea Explorer* had ever gone before, between the southern tip of Andros and the Great Bahama Bank, we dived on one of the most beautiful reefs I have ever seen. Every imaginable kind and color of coral was compressed into giant mushroom shaped formations 15 feet tall. Large stingrays resting in the sand beside the reef would let you approach closely enough to scratch their backs. In a coral cave an 80 pound black grouper turned itself almost pure white while a crowd of tiny

wrasses busily cleaned it. Surprisingly, one large amberjack, escorted by a flotilla of margates, let me stroke its flanks as we swam side-by-side over a sand valley.

Both of Blackbeard's boats are So-las certified, meaning they are Coast Guard approved for safely sailing foreign waters with commercial passengers. Drawing no more than six feet, each is able to take advantage of excellent deserted island anchorages between reefs. Both diesel powered boats have two captains, a dive-master, cook and deck hands comprising a crew of seven anxious to assist you in any way it can to make your trip more enjoyable. Each vessel carries its own 17 cfm Mako air compressor, 36 aluminum 3,000 psi scuba tanks in wet covered storage compartments on the after deck and a series of compartmented cockpit seat hatches large enough to handle each passenger's dive gear.

By the end of this summer, Blackbeard will have added another, identical 65 foot sailing sloop to its fleet. For winter cruises, one or more of these vessels will remain in the Bahamas.

For more information, contact Captain Bruce Purdy, Blackbeard's Cruises, P.O. Box 52-2225, Miami, FL 33152; (305) 888-1226; toll free outside of Florida call (800) 327-9600. 

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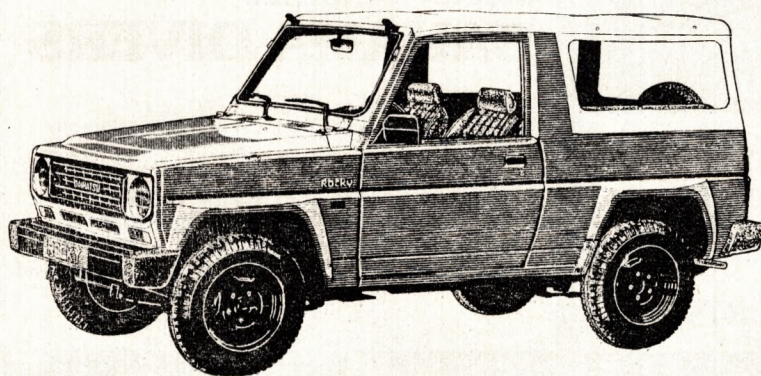
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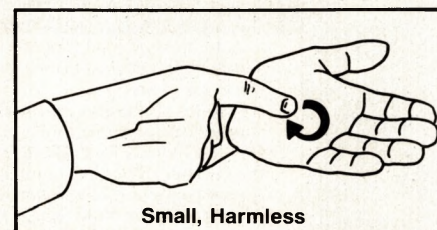
BASIC UNDERWATER COMMUNICATION

Easy To Understand
And Practice

BY JAY FISH

Finally someone has created an U/W communications program that works! Reading from the front page of the study manual of the BUC (Basic Underwater Communications) course Kelton D. Earl says: "The course is simple and logical. It is easy to understand and practice."

I have been diving for six years. I have never recognized a real need for much underwater communication, other than the 30 or so basic hand movements all



divers learn from dive training. This is probably your line of thinking also. But consider for a moment what your feelings are when you are actually in the water. If someone could ask you how you felt, at about a 40 foot depth, you would undoubtedly realize you are really handicapped. It is this realization that prompted Earl to create the BUC course. He explained: "People who dive, either as sport divers or professionals, only realize the need for communication while they're in the water. That is when they wish they could say 'Look at that!' or 'Should we go after it, or stay here?' In almost all cases, the actual situation would have been one diver pointing wildly at what he had seen, while the other shook his head in the attempt to say 'Yes, I saw it' as he shrugs his shoulders in an attempt to suggest the pursuit. The other diver reads the shoulder movement as a 'so what' signal and drops any idea to pursue the interest."

The course lasts two hours. For the first hour you learn 36 new hand signals. The method of learning is unique in that there are no explanations with the signs. In class you discuss the sign and write in the meaning and any notes you wish to make. This is important because many signs have more than one meaning. For example the sign for small is also the sign for harmless. The sign for there is also the sign for that. Depending on the context of the situation, one can determine

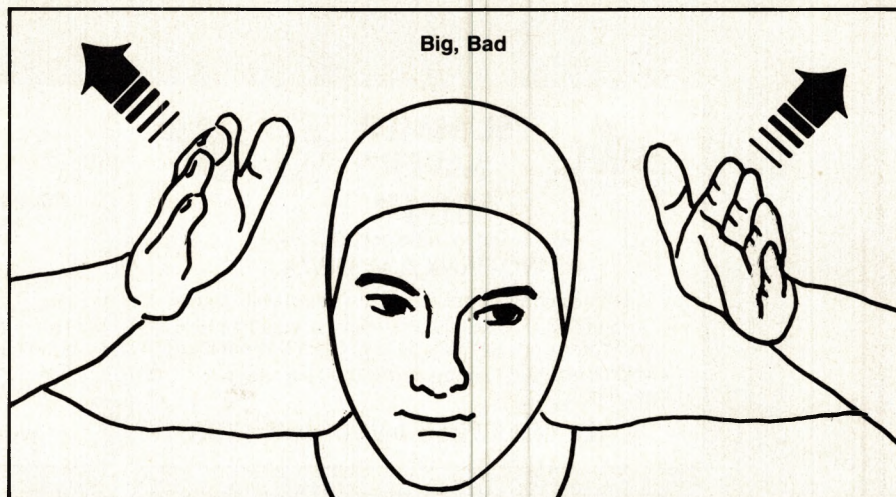
the meaning quite naturally.

How can one learn to talk with their hands in two hours? Surprisingly, one can do very well with the BUC system. One big reason is you can practice all day long out of water. I found the quickest way to learn was to teach it to two young children. They were thrilled and picked it up almost immediately.

Within the two hour time span, you increase your underwater vocabulary from about 35 expressions to around 100. This may not sound so terrific on land, but when I make a dive with a person who "speaks BUC," and one who does not, guess who does all the talking?

There seems no real need to take the course if you can obtain a manual. I first obtained one through the mail. In the back of the booklet is a key you can use to determine the use of the signs. Although more difficult than a verbal explanation, I found I already knew 90 percent by class time. The real importance of the class is practice and insights to the use of the signs.

There is a surprising amount of humor connected with the course. For example, the word no is expressed in the normal fashion of shaking the head side to side. The only difference in the BUC system is you place your open hand in front of your mask with your thumb touching the glass in the fashion of extending your nose and move your hand opposite your head. This



enables your sign to be easily distinguished at a much greater distance.

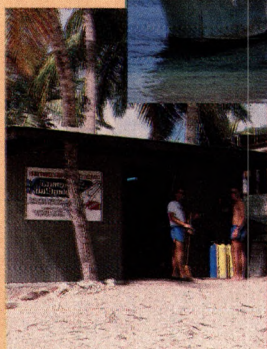
I have found the number one benefit of the system is the enjoyment of being able to express myself and be totally understood. A great side benefit is that we surface only in emergencies or to return to the boat. If we talk, it's underwater!

Currently there are only a few classes being taught in the author's home state. However he mentions that he is confident that with careful marketing and control the BUC language can be universally accepted throughout the world. I took the class for \$6 and that included the book.

If you speak a foreign language, the sign definitions are in 10 languages. A copy of the manual in your language can be obtained through Maxima Dive Shop, 316 S. Alma School Rd., Mesa, AZ 85201. They may be available elsewhere.

Earl states the course is recommended for experienced divers. When a diver is learning to dive he/she should concentrate only on diving, not talking. An advanced manual and course will be out soon for those super talkers who want to really rap below. It will increase the signing vocabulary to an amazing 300 words. ~~xxx~~

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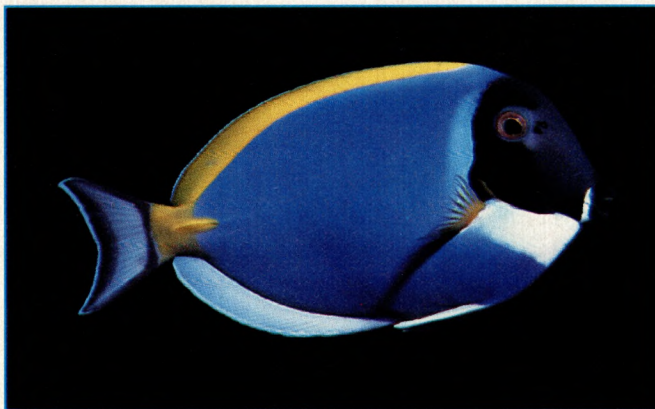
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THAILAND



TEXT AND PHOTOGRAPHY BY CARL ROESSLER

I've dived in a lot of areas that are off the beaten track and even a few where they've never even heard of the beaten track. Still, my recent adventures in Thailand's Similan Islands have redefined remoteness in dive travel.

Our group entered Thailand through exotic Bangkok. This fabled, far eastern city is famous for silk, gems and body massages. All three are remarkably available and of varying quality, rewarding the discriminating shopper with rare values. Indeed, Bangkok is a city full of new experiences: riding the *klongs* or waterways, at dawn; stuffing oneself on superb seafood; photographing the golden temples of the royal palace; dining at the Normandie Restaurant in the Oriental Hotel (possibly the finest restaurant and hotel in the world); watching the ornately stylized Thai classical dancing.

Top: Magnificent temples at the royal palace, Bangkok, Thailand.
Above middle: Jessica Roessler poses with colorful corals.
Above: Powder blue surgeonfish, *Acanthurus leucosternon*.
Above right: The 50 foot dive boat, *Andaman Explorer*.

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After two nights in this sophisticated wonderland, the itch to get in the water became unbearable. We boarded a flight to the sunshine coast of Thailand, a jet hour to the south. The Similans dot the Andaman Sea some eight hours cruising from Phuket. Phuket and Pattaya Beach are famed resort areas that draw many European vacationers to facilities ranging from quaint to opulent. Unfortunately, the diving near the coast is poor—the water is turbid owing to river runoff from the mainland, and marine growth is sparse.

When I first heard there was good diving in the Similans I was skeptical. After all, I've been burned before by overblown reports of great diving in remote areas. Some day I'll write a comedy about some of those trips . . .

I had the good fortune to explore the Similans with an intrepid and wonderful group of See & Sea clients. Our dive cruiser was the 50 foot *Andaman Explorer*, whose crew members are superb hosts. Jeroen and Martin are two expatriate adventurers, their cook Piak is a marvel and their boat boy Bao utterly reliable. These are *their* islands and they worked hard to offer us a complete diving adventure. Day after day they ran dive after dive in a kaleidoscope of wild adventures.

The *Andaman Explorer* can really accommodate only small groups, though some European groups of a dozen crowd aboard. We charter only for groups of five to seven, in the interests of reasonable comfort. Let me quickly specify that the *Andaman Explorer* is not in the luxury class of such cruisers as *Thorfinn* (Truk Lagoon), *Tristar* (Philippines), the *Cayman Aggressor* or the *Okeanos* (Virgin Islands). This is more primitive exploration, without air-conditioning or carpeted saloons. In fact, this is dive travel as it was years ago, when we traded comfort to discover what lay over the horizon.

The Similans offer two totally opposite sorts of diving. Indeed, the sites are so remarkably different you can't believe they are merely two sides of the same islands. On the western side, gigantic rounded boulders reminiscent of Baja California are festooned with brilliantly-colored soft corals and gorgonians. Unlike, say, the intricate branching coral communities of the Caribbean, the beauty here is brutal and powerful; exotic Indian Ocean fish species abound, skimming through the tunnels created by the piled-up boulders.

Yet, the eastern side of the islands are typical tropical coral reef. Stands of delicately branching antler corals thrive in coral shallows leading to a sloping drop-off. Some massive coral heads host communities of nearly tame fish where one can take portraits to one's limit of film.

One fascinating phenomenon is the schooling of countless small anchovy and dwarf herring about large coral heads. Looking out across the reef one sees these schools as indistinct dark clouds. Only when you approach closely do the clouds resolve into thousands of tiny individuals of two or more species. Another schooling species which gave us extraordinary pleasure were the beautiful spadefish. Sometimes a hundred or more would swirl about us in open water, dancing to music only they could hear.

One of the most beautiful photo subjects in these exotic islands is an ugly animal with a nasty reputation—the crown of thorns starfish *Acanthaster*. For some reason, the Similans' version is brilliant iridescent blue or purple. Believe it or not, we searched all over these reefs to find specimens to photograph.

There is one other superlative attraction of the Similans—the finest "talcum powder" beaches any of us had ever seen. Between dives, our hardy explor-



ers would snorkel to shore to enjoy these deserted paradises.

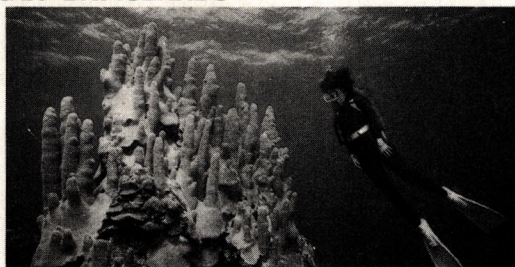
One thing you don't see in the Similans is anyone else. Aside from a few Thai fishermen who came in to escape stormy weather at sea, we never saw any other sign of human activity—no scrap paper or tin cans on the beach—nothing. The islands were as if discovered that very day.

Are there negatives here? Yes, three I can think of: tricky weather, a lack of real comfort and privacy, some past dynamiting of reef areas. Yet looking at the pictures upon my return I was surprised to see so many subjects that were *different*. This is an explorer's place. For See & Sea it is a page from our past. In this new era of million dollar, second generation dive cruisers, step back with us in time to the adventures of yesterday. This is what the Yucatan was like in 1967 or the Galapagos in 1972 or the Red Sea in 1974. For the photographer in particular, it is a land of new subjects, new experiences. For those of you not put off by remote, adventurous exploration, Thailand's Similan Islands could be just what you've been looking for.

For further information, contact See & Sea Travel Service, Inc., 680 Beach Street, Suite 340, San Francisco, CA 94109. x

Anthony's Key Resort

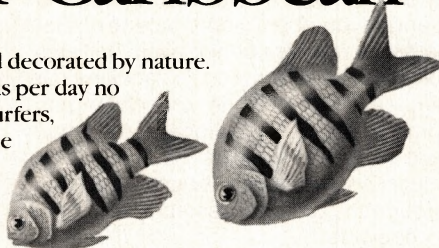
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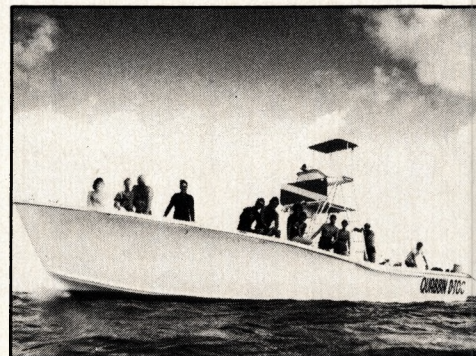
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QUABBIN BOAT

Quabbin Dives (Cayman) Ltd. has added a third boat to its fleet, the 45 foot custom built *Quabbin D-Too*. The new boat, which can cruise at 18 knots, was built in Tampa, FL. Specially designed tank



photo/Ed Wolfstein

racks, seating benches and an above deck steering station leave a large, uncluttered deck for diver comfort.

Quabbin is operated by Caymanian, Arthle Evans, who divides his time between divemastering and sportfishing. PADI instructor Chet King, assisted by PADI divemaster Bob Tremayne and boat captain Allen Bodden, round out Quabbin's dive staff. All new dive packages for 1985 are now available through Two World's Travel; 1307 First St., Humble, TX 77338.

ANTHONY'S KEY SUMMER RATES

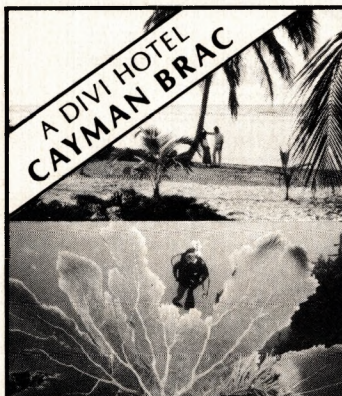
Anthony's Key Resort is offering low rates for summer travelers. For information call (800) 227-DIVE; in Florida (305) 858-DIVE; ask about the July special Dive 'n Save.

ANSE CHASTANET EXPANDS

Anse Chastanet Hotel, in Soufriere, St. Lucia, has expanded its scuba facilities. It is now the most extensively-equipped dive center among the Windward Islands and the hotel is offering a dive package.

The dive center, under the direction of Wayne and Karen Brown, recently added an E-6 film processing lab as a complement to the camera rental and photo instruction program. Other activities include scuba instruction, resort courses, gear and boat rentals. In addition to two outboard motor boats, Anse Chastanet will soon be adding a large, new tri-hull capable of carrying 24 divers, that will load directly from the beach.

The Anse Chastanet Dive Package, for seven nights/eight days, is being offered for the winter and summer seasons. The winter season ends April 15, the summer season begins April 16.



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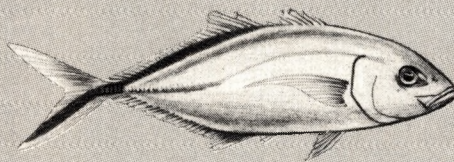
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The Bar Jack

(*Caranx ruber*)

Jacks are swift, strong, silvery fishes that roam the open sea. Normally, they will only swim into a reef area to feed on other, smaller fishes—many of which become easy targets for the predator's unexpected, lightning-quick strikes. □ The bar jack belongs to the fish family Carangidae, a diverse group which also includes the scads and pompanos. The body shapes of the carangids vary greatly, including the elongate, cigar-shaped scads (*Decapterus*); the deeper-bodied but swift-looking jacks (*Caranx*); the even deeper-bodied and flattened pompanos (*Trachinotus*); and the extremely thin and deep lookdown (*Selene*). □ While all of these fishes appear quite different, they have several common characteristics: slanting foreheads, deeply forked tails and a pair of spines just in front of the anal fin. These spines can lie flat in a groove and so will not always be apparent. In the juveniles, the spines are connected by a membrane and appear to be one continuous fin. □ The bar jack belongs to the genus *Caranx*, and is the most common jack of West Indian waters—the one most often seen over reefs (Randall). It ranges throughout the tropical western Atlantic as far north as New Jersey and in the Bahamas is often seen in large schools in July and August—a time when it is called passing jack (Bohlke and Chaplin). □ The most distinguishing physical characteristic of the bar jack is a blue band that extends along the base of the dorsal fin from the caudal peduncle to the tip of the snout. There is also a dark bar that covers most of the lower lobe of the caudal fin, crossing to the base of the soft dorsal fin. The bar jack grows to a maxi-



mum length of about 22 inches. □ The shape of the head and the forked tail of the jacks, together with their silvery, swift appearances, are usually enough for a diver to distinguish them from all other fishes. Another prominent characteristic of the jacks is the row of bony scutes (spiny, thickened scales that are sharp) along part of their lateral lines, usually in front of the tail. However, amberjacks (*Seriola*) and pompanos (*Trachinotus*) do not have these scutes. □ The Carangidae includes about 200 species around the world in both temperate and tropical waters. They are believed to spawn offshore and the eggs drift with the plank-

ton until they metamorphose into the juvenile forms. The young carangids continue to drift—in the protective shelter of sargassum weed, floating jellyfish or even clumps of debris. Most juveniles of the family have a banded pattern (as does the juvenile bar jack), which

is lost with growth. At a certain point in their maturation, the young fishes leave the plankton and take up a schooling existence nearer shore. As adults, they do not inhabit reefs but only invade them to feed on other, smaller fishes. □ Some carangids enter fresh water for periods of time, but return to the sea to spawn. Therefore, the juveniles of some species, rather than drifting in open ocean, stay in brackish, inshore areas. In these estuarine nurseries, they grow up, swimming out to sea at a certain stage in their development. □ Jacks are excellent for food and are considered prime game fishes. However, several of the larger carangids—including the bar jack—have caused ciguatera (fish poisoning). >>>

Photo By Carl Roessler-Text By Hillary Hauser

Roessler shot the photo in 50 feet of water off Grand Cayman Island. He used a Nikon F with 55 mm macro lens in a Niko-Mar housing and a Bauer E252 strobe. Kodachrome 64 at f11, 1/60 second, two feet from subject.



GUARANTEED FUN



Holiday Inn Offers An Armor-Clad Dive Package



TEXT AND PHOTOGRAPHY BY GERI MURPHY

A diving vacation that is guaranteed or your money is refunded—sound like fantasy or advertising hype? Not so. The Guaranteed Dive Vacation does exist and it works great.

If you have done any amount of overseas travel no doubt you have experienced or observed the traveler's dreaded curse—overbookitis. This unhappy condition occurs when you blissfully march up to the hotel front desk, present your confirmed reservation and are coolly advised the hotel is overbooked. Worse yet is the fury which descends over your body when you drag all your dive gear to the beach only to find the dive boat is full and cannot possibly take another passenger. Although these situations are rare, they do happen and they can certainly ruin a diver's vacation.

Fortunately for traveling divers, some clever people at the Holiday Inn of Grand Cayman have found a way to avoid these pitfalls—or at least compensate the victims should they ever happen.

The Guaranteed Dive Vacation is a simple proposition. A diving guest who

Top: Soto's dive boats anchored at Soto's Reef. This site has coral heads as shallow as six feet below the surface and offers many tunnels and coral chambers. **Inset:** An aerial view of the Holiday Inn and Soto's fleet on the beach. Soto's and the Holiday Inn offer the diver a guaranteed dive/accommodation package. **Middle:** Cayman visitors board a Cayman Airways 727 jet for their flight home. **Above:** Fish feeding at the railing of the *Oro Verde*. This 184 foot ship was sunk in 50 feet of water to create a dive site.



The Holiday Inn has 225 rooms, two restaurants, three cocktail bars, a freshwater swimming pool and a fantastic beach.

has a confirmed reservation is absolutely guaranteed a room awaiting his or her arrival and a place on the dive boat each and everyday of the vacation. If there is no room on either the boat or at the hotel, for even a single day or a single dive trip, the *entire* one week cost of the diving and hotel accommodations are happily refunded. Guests are not farmed out to some other hotel or some other dive boat. They actually get their money back. The only part of the vacation that is not refunded is the air fare and personal expenses for food, drink, cabs, etc.

Now you might wonder if this is some sort of half-baked scheme that is going to fall apart the first time some clerk fouls up the bookings and several claims are made. Surprise! This program has a two year record of success and the guarantee is fully supported in writing. Over 8,800 divers have gone through the Holiday Inn Guaranteed Dive Program without a hitch.

By now you must be thinking "the hotel and boat are guaranteed, but who is going to guarantee the diving?" This is certainly a valid question for most parts of

the world, but not Cayman. If there is one thing you can count on, it's consistently good diving year-round. The Holiday Inn is right in the middle of Seven Mile Beach, on Grand Cayman's leeward west coast. The ocean in this area is generally flat calm and visibility along the drop-off is always good. Nature provides the guarantee for great diving.

A few words about the hotel. The Holiday Inn on Grand Cayman is by far the largest hotel on the island (225 rooms) and offers the widest selection of activities and services. There are two restaurants, three cocktail bars, a unique freshwater swimming pool, tennis courts, a fantastic beach, all sorts of watersports (by Aqua Delights) and a nine hole Jack Nicklaus designed golf course nearby. There is also a shopping mall and a super nightclub with live entertainment six nights per week. Every room is carpeted, air-conditioned and equipped with a telephone. The hotel is an official Holiday Inn franchise and thus meets the stringent quality requirements necessary for the Holiday Inn stamp of approval.

Last but not least, the Holiday Inn offers

the convenience of a dive shop on the hotel premises and dive boats that pull right up on the hotel beach to load. Diving couldn't be more convenient. Diving services are operated by Bob Soto's Diving Ltd., Grand Cayman's largest and best known dive charter service. This energetic company maintains a fleet of seven dive boats and a staff of over 35 people. Their track record for safety is spotless and their standards are extremely high.

In fact, Holiday Inn's Guaranteed Dive Vacation is an excellent choice for new divers who are about to embark on their first Caribbean dive trip. Bob Soto's has well experienced scuba instructors and divemasters who are most willing to take beginners under their wings and help them through their first ocean dives. It's one of the safest ways to be introduced to the joys and thrills of wall diving or night diving.

For more information and prices on Holiday Inn's Guaranteed Dive Vacation, write to: Holiday Inn Grand Cayman, 5100 Poplar Avenue, Suite 2219, Memphis, TN 38137. For reservations you can call U.S. toll free (800) 421-9999.

CAYMAN DIVING VILLA STYLE:

First Class Diving First Class Accommodations



photos/Geri Murphy

BY BARBARA CURRIE

This is the substance of an islophile's fantasies: a week in a world class diving destination, wallowing in opulent luxury in an oceanfront, \$200,000 apartment, forgetting others are enduring January's cruelties. In an hour, after I've enjoyed the serene, early morning ambience of Grand Cayman's Seven Mile Beach in comfort and privacy, I'll leave my seaside patio, put a good bottle of wine in the refrigerator to chill all day and take a short stroll down to the beach. Don Foster's boat will be waiting—my aquatic chariot to the underwater world that made this island famous.

Luxury, privacy, convenience and personalized service are the ingredients for Cayman's most luxurious—and least publicized—dive vacation. This year, Don Foster's Dive Grand Cayman is offering its Cayman clientele a unique choice in accommodations in addition to their Royal Palms Hotel package. Working with Marc Redt, owner/manager of Hospitality World Ltd., a condominium management firm, they can offer customers beachfront or seafront luxury apartments equipped with (depending on the property) such comforts as satellite TV, gourmet restaurant, tennis courts and spas.

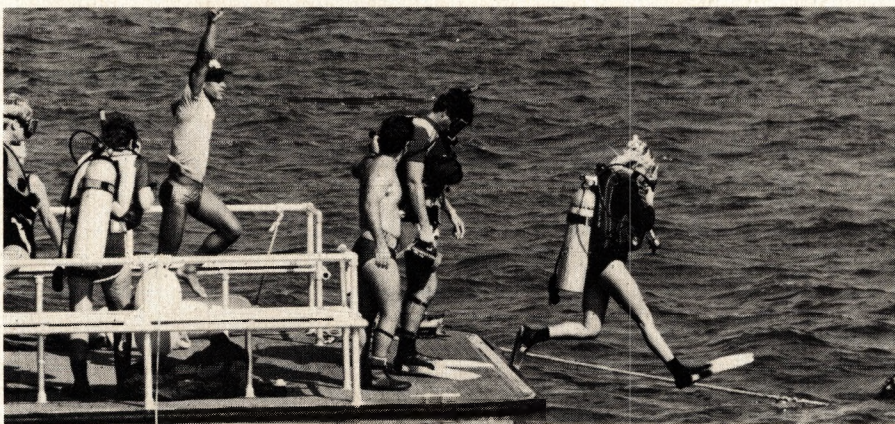
These very reasonably priced packages include a choice of a one or two bedroom unit at Hospitality World's nine properties, of which all but one are on Seven Mile Beach.

Top: A diver explores the giant coral archway at Big Tunnel. **Top left:** Villas of the Galleon condominiums offer privacy and are perfect for those wishing to self-cater their dive vacations. **Inset:** The Cayman Falls Shopping Plaza is the site of both Don Foster's Ocean Photo Center and Jil Foster's Ocean Designs boutique. **Bottom left:** Don and Jil Foster.

Villas of the Galleon, Silver Sands, Coral Reef, Tamarind Bay, Paradise Manor, White Sands, Turtle Beach Villas and Sundowner—each has its own special ambience and varies in size from 6 to 96 units. Villas Pappagallo, near Spanish Cove resort and right off Cayman's legendary North Wall, is an exceptional property. Its 42 units are decorated in a striking Mediterranean design and it has a gourmet restaurant on the premises.

Why the concept of self-catering dive vacations on Grand Cayman has not caught on in today's cost-conscious, quality demanding marketplace is a mystery to those of us who have experienced and enjoyed this very different kind of holiday. In addition to Grand Cayman's incredible variety in underwater experiences and marine life, there is also more variety in accommodations available here than on any other Caribbean island popular with divers. Each has its own appeal, from small diving lodges to the beach-front full service hotels. What's special about the condominium or villa experience is a combination of convenience and privacy. If you want to pamper yourself and want the flexibility this lifestyle provides, you'll discover it with Foster's latest arrangement.

"Condominium" may be the cause of a misconception among divers used to unhassled and relaxed environments.



The 36 foot flattop, *Undersea Diver*, is one of Foster's fleet of four dive boats.

The word conjures images of chrome and glass monoliths, the residential high rises of Florida's coasts, rather than the low-slung, maximum five story properties of Grand Cayman that blend with the coastline in a far more favorable way.

"Villa" is a much more accurate word for Grand Cayman's many luxurious apartments: Webster's defines it as, "the rural or suburban residence of a wealthy person." Cayman diving, villa-style could spoil you. Each unit is air-conditioned and equipped with complete electric kitchen

and supplied with enough basic utensils to make self-catering convenient. And, all apartments are completely and tastefully furnished. It's like exchanging homes with a millionaire for a week—most of these units sell for well over \$130,000.

In addition to convenience and privacy is another important factor: This kind of comfort is very economical. Particularly during summer months, when rates on Grand Cayman drop as much as 40 percent, the villa vacation is one of the best buys in the Caribbean. Not only can couples share a two bedroom unit, but the ability to eat in and save on restaurant bills is important.

Add to all this the personalized service, the distinguishing characteristic of Don Foster's Dive Grand Cayman and you have paradise, topside and below.

One of the great comforts of a writer's life is discovering a product in the Caribbean that is consistently good. This is the third season I've written about Don and Jil Foster's operation and while it may have grown significantly, the service has not suffered. In fact, it's even better.

Villas vacationers are picked up, either by boat on the beach at their resort or by Foster's new air-conditioned, comfortable van and provided with all necessary transportation throughout their stay for the six two tank dives included in the eight day/seven night package.

Morning two tank dives are aboard one of the Foster's four craft fleet: *Reefseeker* and *Adventure Diver*, both 26 feet; *Wavemaker*, a 34 foot custom V-hull that doubles as a charter fishing boat; and the 36 foot flattop, *Undersea Diver*.

Foster's main headquarters remains the dive shop at Royal Palms Hotel, which has been renovated to include a boutique and gift shop.

The most impressive addition in the past year is Don Foster's Ocean Photo Center and Jil's exclusive clothing bou-

tique, Ocean Designs. These are both in a unique shopping area, The Falls, on West Bay Road, convenient to all villa dwellers. Ocean Photo offers complete underwater camera rental and film processing services; introductory and advanced photo courses; and, new for 1985, photo/dive packages for Don Foster's customers.

Ocean Designs features a wonderful assortment of trendy island fashions, including an excellent selection of swimwear, jewelry and batiks of Androsian material. In fact, it's one of the best-stocked clothing boutiques I've discovered in the Caribbean and a must stop before departing Grand Cayman.

The Falls, when I say unique, is exactly that. The wooden construction, elegant landscaping and system of pools and fountains is unexpected on a Caribbean island. The unusual variety of boutiques and restaurants—and the popular Windjammer Lounge bar and nightclub with its Lauderdale-style decor—make this complex a convenient and interesting topside option for your non-diving hours.

During my stay, diving and living on Grand Cayman in a manner to which I could easily become accustomed, I not only enjoyed revisiting such sites as Sentinel Rock and Jil's Jubilation on the North Wall, but also a day in blue water with Don aboard *Wavemaker*.

The Cayman Islands police sponsor an annual gamefish tournament each year and the 1985 competition coincided with my arrival. I traded a day of diving for eight hours of trolling for blue marlin, yellowfin tuna, wahoo and dolphinfish. I'm not sure Don didn't pen those fish in advance, but we brought back a fine catch of tuna and released a marlin.

I'm recounting this angling experience for two reasons. First, that fresh yellowfin became a gourmet staple of my diet during the rest of my villa vacation: I dined with island friends in my villa on yellowfin *au vin* washed down with Pouilly-Fuisse: elegance and convenience.

Second, if you opt for this unique kind of diving vacation during June 1985, you might share a similar experience. June is Million Dollar Month in the Cayman Islands, a month-long big money fishing tournament: Don Foster is a first class guide and captain. You may end up owning your own villa if you enter—that's one of the prizes offered. If not, you can still enjoy a short term with the lifestyle of the rich and famous. Only, with this Foster's combination on Grand Cayman you could make a millionaire envious.

For information call Scuba Tours, toll free, (800) 526-1394; in New Jersey, (201) 256-9115; or write: Hospitality World Ltd., P.O. Box 952, Grand Cayman, BWI. On Grand Cayman, call, Don Foster's Dive Grand Cayman, 97025.



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*Drawing August 31, 1985. Limit one entry per customer. Trip includes 6 days/6 nights aboard the M/V ISLAND FANTASY, meals, and diving. Taxes and transportation to Riviera Beach, FL are not included.



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TEXT AND PHOTOGRAPHY BY RONALD D. AKESON

Southern California beach diving—ask the opinion of a local diver and his answer is likely to be either a nightmare of rolling endlessly in the surf, lost gear and poor visibility or exhilarating accounts of excitement and adventure that will have you hanging onto the edge of your seat in anticipation. There are many beach diving veterans who swear by surf entries but there are just as many who



swear at them! Such are the shores of Southern California; not for all but available to all.

There is no place else in the world where you can watch a shimmering school of barracuda glide effortlessly through a massive bed of giant kelp then, after an air fill and short drive northward, explore the nudibranchs and rockfish common to Northern Pacific dive sites—all within the same day. It is even possible to have both worlds on the same dive!

A fantasy too good to be true? Not at Leo Carrillo State Beach. Just 45 minutes north of Los Angeles on the scenic Pacific Coast Highway, it offers something for everybody at every skill level. Entrance to the park is via either limited free parking along the highway (which tends to fill up

(Continued on Page 88)

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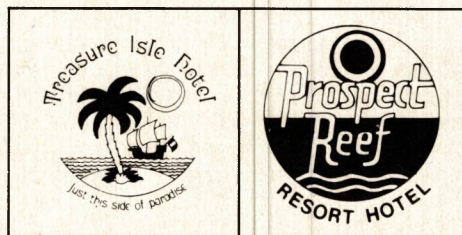
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ANDROS BEACH HOTEL

Barrier Reef Diving At Your Doorstep

BY BARBARA CURRIE

Neal Watson is one of diving's legendary characters, the "Humble Hero" of Bimini for a decade, holder of a variety of offbeat world records, including the deepest dive on compressed air—437 feet—set in Freeport in 1968. Andros, largest and least populated of the Bahamas chain, has been the target of adverse publicity in recent years as a drug-runner's roost.

Knowing neither Neal nor Andros, I envisioned a New Year's adventure when I arrived at Walker's Cay Jet Center in Ft. Lauderdale International Airport: I pictured being flown in a twin-engine aircraft, piloted by some macho out-island outlaw, to an equally roguish island.

Instead, I met a sensitive soulmate and keen businessman who proved an unflappable pilot and conscientious diver in perfect physical condition at the age of 45. And, Andros? If that overworked word unspoiled accurately describes any island and its diving, this is it. The reports of the wild Bahamian west exist only in one sense: its untamed and unknown offshore areas.

As we overflowed Bimini, midway in the 150 mile, one hour flight to Andros, Neal descended to 500 feet and dipped the wing of his Skymaster for a clear view of his Bimini Undersea Adventures location. That island is an established and popular one with U.S. divers. I asked Neal why, of all the Bahamas options, he chose Andros for his second venture.

"You'll see in 30 minutes. I dropped in there eight years ago and thought north Andros, and that site, had everything necessary to become a great dive destination. When the Andros Beach Hotel became available in late 1983, I decided to expand, because I think the island is a real sleeper. You tell me what you think when you leave," Neal said.

Thirty miles west of Nassau, Andros is easy to reach from both Florida and the international gateway of New Providence Island. It is unique: It has an abundance of pure, fresh water and exports one million gallons a day by barge to Nassau. It is the country's agricultural apex and supplies almost every necessary fruit or vegetable; has excellent paved roads; telecommunications; and a 5,500 foot runway. Yet the untapped potential of Andros as both vacation, agriculture and development capital of the Bahamas is curious. A "massive"—by Bahamas

measure—105 miles long and 50 miles wide, it is home for only 8,000 people and remains very much out-island in atmosphere and undeveloped.

I didn't know this and I'll wager most U.S. divers don't either: A mile east of this island is the second longest barrier reef in the world. It sprawls, unknown and unexplored, for 140 miles. Andros also has a fascinating system of blue holes, both inland and offshore. Again, for the most part, unexplored, these dip down hundreds of feet into the island and the ocean floor.

Approaching Andros in a small aircraft is breathtaking. The crisp, clear morning provided us with a crystal clear panorama of the reef structure within diveable radius of the Andros Beach Hotel and the northeastern tip of the island. The sea below was an intricate, Persian rug of varied blue patterns indicating vast stands of elkhorn coral, which broke the surface and shallow gorgonian gardens just offshore. The barrier reef began within one-half to one mile east. Beyond, giant spur and groove formations, obviously mini canyons, ledges and crevasses, fanned out and disappeared into the Tongue of the Ocean. This 6,000 foot deep abyss separates Andros from Nassau and the Exumas and is a playpen for pelagics.

"We don't know what's down there," Neal said. "We opened a year ago and the nearest dive operation is 40 miles south. It's going to take us 10 years just to chart the 10 miles in front of the hotel."

Just then we spotted a large undulating shadow near the reef line: a shark of some kind. "We see sharks on about 25-30 percent of our dives. Makos, lemons, bulls and others," he added. "Andros is really virgin diving—but don't worry," he grinned beneath his marine fatigue cap, "that's the wildest side of Andros."

Andros Beach Hotel is 10 miles from San Andros Airport, an easy and unusual ride through pine forests that suggest the Carolina coast rather than the tropics. The 20 room resort's colonial brick exterior and entrance are shaded by a huge fig tree and Norfolk pines. Beyond these guests find their newly refurbished rooms open onto a lush lawn which ends with 400 feet of fine beach, palm trees and a freshwater pool/patio area.

Andros, in fact, has grass—but not the kind I'd read about. It's an obvious indication of the availability of fresh water

here, a luxury on most islands for divers and one of many plusses about Andros Beach. Between the abundance of good plumbing with fresh water and the diving offshore, I think Aquarian Acres might be a better name for this resort.

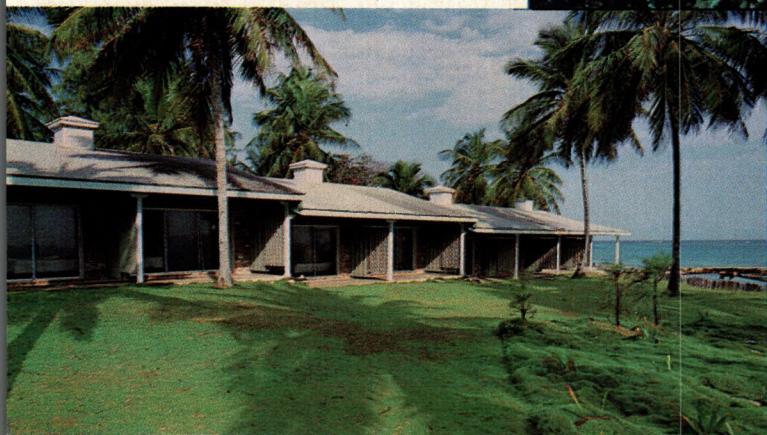
Andros Beach consists of the main building with 10 rooms; three adjacent beachfront cottages and four villas across the road. The hotel was built in 1967 as the base for land development junkets from the U.S. and changed hands so many times it never really functioned as a resort. Neal took over the four acre property in December 1983. He and his brother Carl, now manager, worked for five months to refurbish the resort and restore it to a comfortable vacation setting from the ramshackle campground it had become. A large freshwater pool, attractive oceanview bar and dining room and a boutique complete the land facilities.

Next to the hotel, on the property, is the dive center of Andros Undersea Adventures, managed by Dallas transplant Don Smith, a PADI instructor, assisted by NAUI instructor Rick Pars and divemaster Sandra Lipscomb. Facilities include two 15 cfm compressors with a 10,000 cubic foot storage tank, 100 steel 72 tanks and equipment to comfortably accommodate 40 divers.

The Andros Undersea fleet includes a custom diesel 40 foot craft designed by Neal and built in Miami and a 28 foot fiberglass custom. Both are moored at the Andros Beach dock directly in front of the hotel for quick and easy loading of divers and gear. Morning two tank dives leave at 9:00 am and the afternoon single tank dive, at 2:00 pm.

Because the barrier reef lies only three-quarters to one mile offshore, the beach and dock area are protected. The snorkeling directly offshore is so good Andros Beach was selected as a snorkeling stop for Windjammer cruise ship *Fantome* passengers. This majestic, four masted schooner is an interesting sight on the eastern horizon for a few hours each week. What this means is Andros Beach is a good choice for families or divers with non-diving companions who want to enjoy a fine beach and some of the best shallow sea scenery possible.

Diving, however, is what Andros will become famous for. At least, that's what I believe, based on what I saw from 150 feet above and 35-100 feet below. An-



Andros Beach Hotel (above) has newly refurbished rooms that open onto a lush expanse of lawn. Guests of Andros Undersea Adventures are often treated to visits to previously unexplored dive sites.

dros' shallow waters offer some of the finest coral gardens and abundance of reef fish I've seen anywhere. But apart from this profusion of reef activity, what gave me the greatest thrill was summed up by Neal himself after our first 75 foot dive on a site that he, Don Smith and I discovered that afternoon.

"We know so little about this area we never know what to expect. There's so much out here that's unexplored we're just starting to name sites now."

In six dives, we saw lots of fish. I was hypnotized by the truly virgin (and I hate that word) quality of these reefs, the thriving coral formations, particularly the magnificent shallow elkhorn forests. Beyond the reef line, in 80-110 feet along the gradual slope to the drop-off, I spotted some big distant shadows several times. Within identifiable distance, I saw half a dozen eagle rays, a manta and—yes it's true—a sizeable bull shark. Visibility averages 80-100 feet year-round.

The drawbacks to Andros diving are minor but worth mentioning. Those craving the kind of sheer wall diving found off Cayman won't find it here. The actual drop-off starts deeper than 120 feet and the lip of the Tongue of the Ocean is a gradual slope that begins at about 60 feet. You can safely hover over the drop-off for that view of opaque blue sea-space, but this is not a wall diver's location. Second, Andros is not in the Gulf Stream and winter water temperatures can be as low as 70°F: Bring a full wet-suit during those months.

In addition to sites visited regularly by Don and his staff, many guests are treated to the kind of exploratory trips we did on three of our dives, all within a 10-20 minute ride from the hotel. If Andros Undersea Adventures has two cardinal rules they're flexibility in dives, to suit guests' wishes and no overcrowding on their custom craft.

Plans for 1985 include an expanded



Carl Watson

Neal Watson

Don Smith

photos/Stephen Frink

dive center, the introduction of E-6 processing and the beginning of a network of permanent moorings on established regular dive sites.

On top of all this is more good news: Andros Undersea Adventures offers incredibly reasonable, all-inclusive packages from Ft. Lauderdale or Nassau which offer extras you don't get in many other vacations: Roundtrip air fare; three meals daily; three dives daily and one night dive. Packages include *everything* but the \$5 departure tax and your bar bill.

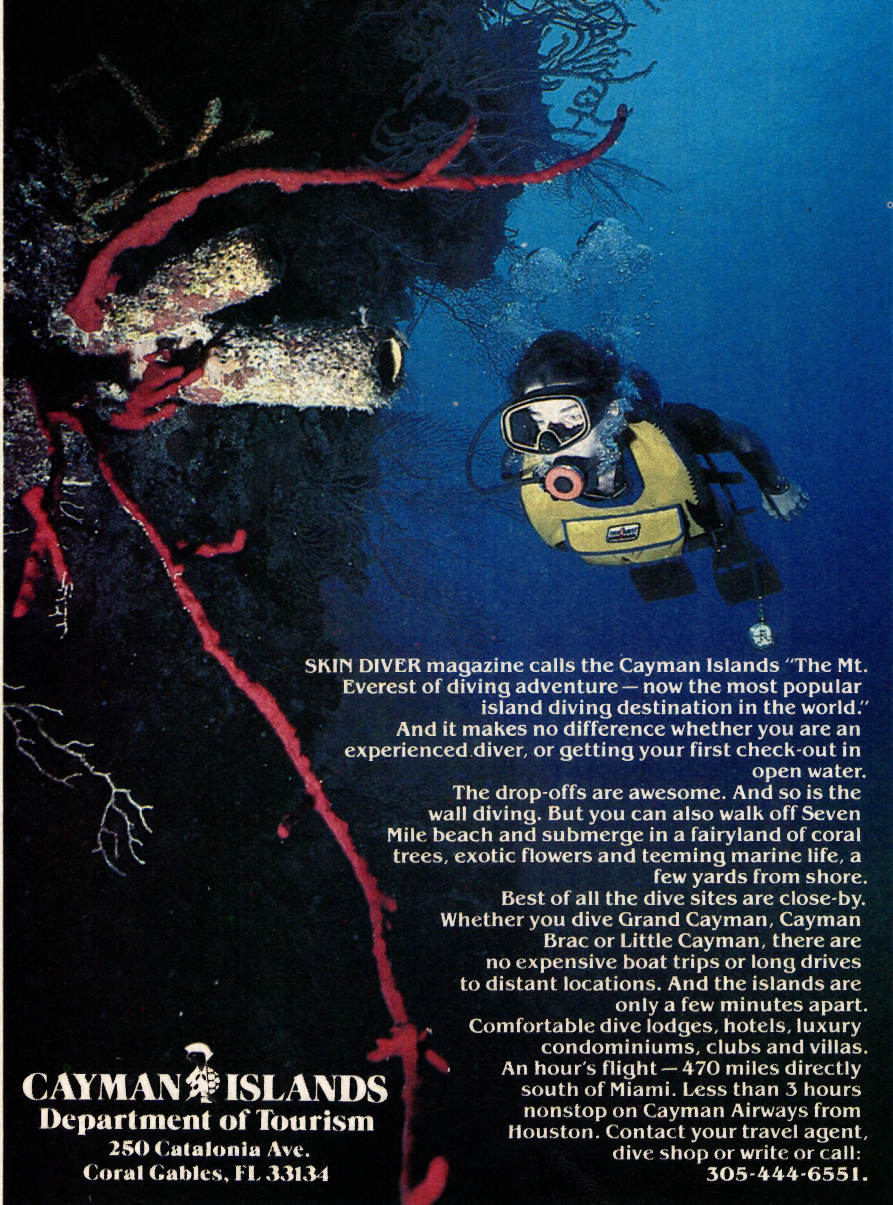
Neal Watson has made it impossibly easy for experienced divers to discover this new Bahamas dive destination, which, because of its location, promises to remain that way for the next decade. Full information on departures from Ft. Lauderdale on Atlantic Coastal Airways

or connecting flights from Nassau and vacation packages are easily obtained from the Ft. Lauderdale office.

Since we couldn't dive and fly on our last day, I was granted a last request: a fascinating tour of Nicholl's Town and nearby settlements and one last Andros spread of fresh lobster and conch. This Bahamas out-island proved warm and gentle; only its offshore reefs were wild and untamed. Forget what you may have heard about a wild west tropical territory. Neal Watson's wild Bahamian west lies east of the island. Get there soon.

For information contact Neal Watson's Andros Undersea Adventures, P.O. Box 4960, Ft. Lauderdale, Florida 33338. Outside Florida phone, toll free, (800) 327-8150; in Florida and Canada: (305) 564-8633. ✕

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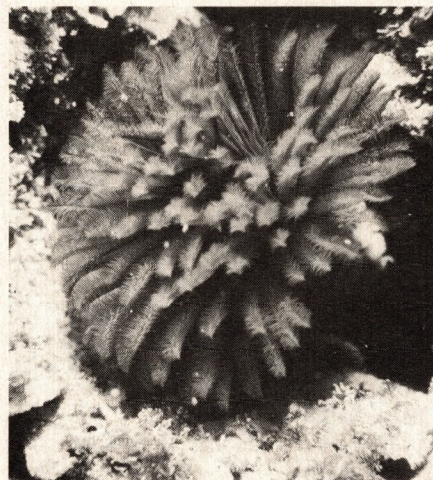
CAYMAN ISLANDS
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LEO CARRILLO

(Continued from Page 84)

rather quickly on nice days, so arrive early) or by paying a \$3 day use fee to the ranger at the park entrance on the east side of the highway. The fee is a worthwhile investment in maintaining the park in its natural state for future dives and divers. Also, it means you can use the facilities which include hot showers in the campground and cold ones outside the beachfront restrooms and picnic sites with barbecues on which to cook the day's catch. If all of this were not enough, the 1,578 acre park has 140 campsites for longer stays. Register for the camp spaces with the local ranger or purchase advance reservations through Ticketron.

The 1.1 mile long shoreline of the park is divided into two distinct beaches by the rocks and coves of Sequit Point. The northern section is most easily reached by following the park road under the Pacific Coast Highway to a large asphalt parking lot. This sandy beach has a



steeply sloping sand bottom that drops abruptly to 30 foot depths on the inside edge of the kelp bed just 50 yards offshore. It provides the best entry in summer months because it is protected by Sequit Point from southern swells. In the winter, the southern beach and cove offer ready access as the point shields them from northern swells. The sand bottom here has a more gradual slope than its northern counterpart, with the inside reefs lying in 15 to 20 feet of water—but be prepared for a longer swim to reach the kelp. Caution must be exercised when entering the water in this cove as there are rocks that may be covered at high tide and because this is a popular surfing spot. An entry farther down shore may be a better alternative. The best way to reach this is to park along the highway and walk down the small hill or walk one-half mile up the coast from Nicholas Canyon State

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
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Beach. On calm days it is even possible to enter directly off the center of Sequit Point. On days with moderate to heavy surf this route should be left to divers with rocky beach experience.

Visibility on the reef averages 10 to 15 feet but can easily reach 30 during the fall and winter when offshore winds blow, flattening out the swells and creating an upwelling. Perhaps the greatest factor that affects water clarity is runoff from local streams. Zero visibility is not at all unusual after heavy rains: It is a good idea to wait a couple of days before diving to allow the sediment to settle out. If in doubt, call the Los Angeles County Lifeguard 24 hour surf and weather report, (213) 457-9701, for an update on northern L.A. County beaches.

An underwater photographer's paradise, Leo Carrillo is one of the most ecologically diverse and interesting dive sites to be found on the Pacific Coast. It is in this area that warmer southern waters and colder northern ones blend to support a flora and fauna characteristic of both. The kelp holdfasts cling tenaciously to the many rock outcroppings providing shelter for hundreds of animal species. Everywhere you look there are encrusting sand structures, which upon close examination reveal the delicate purple tentacles of colonial sandcastle worms. Blue, knobby starfish, giant keyhole limpets, chestnut cowries and various anemones are plentiful year-round. At least a dozen species of nudibranchs traverse the colorful sponges, hydroids and bryozoans with almost complete immunity from predators. The two spot octopus probes the rocks in search of food. Every crevice seems alive with a different kind of rockfish. Sheephead and calico bass swim lazily beneath the kelp fronds which form the canopy, but look on the outer reefs for the really big fish.

Depths on the seaward edge of the kelp reach 40 to 50 feet and are your best bet for finding lobster and abalone; the inner reefs are pretty much picked over. Keep your eyes open when out here, California gray whales travel close to shore on their annual migration and there is no telling what you might see. There is even one account of a killer whale (rare for Southern California) approaching a skin diver in the kelp, looking him over, then swimming off! Just remember to save enough air for the trip back to the beach under the kelp because it can grow quite thick. Don't forget to look for halibut on the sandy bottom.

All in all, Leo Carrillo offers even the pickiest beach diver a number of reasons not to dive elsewhere. Entertain thoughts of a colorful reef alive with activity; easy accessibility with year-round entry points; good visibility with plenty of subjects for underwater photographers; and the complete facilities the park has to offer. Next time you can't think of a new and exciting place to dive, think Leo Carrillo State Beach. 

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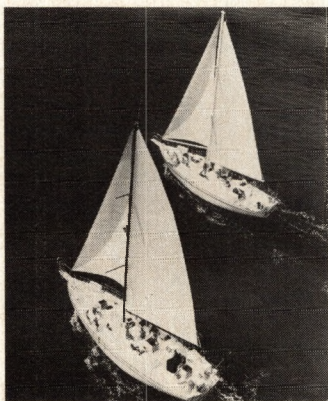
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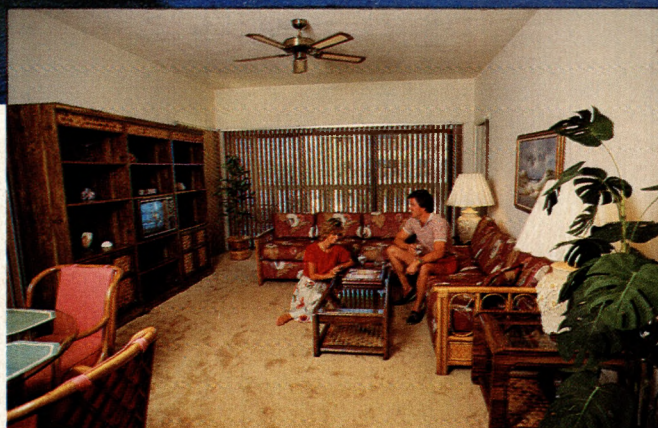
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Port Largo Villas...



Top: Boats docked at Port Largo. Above: Interior of a Port Largo "villa." Left: An aerial view of Port Largo's easy access to the open ocean. Below left: Barbara Doernbach feeds a barracuda at Christ of the Abyss statue in Pennekamp Park.



TEXT AND PHOTOGRAPHY BY STEPHEN FRINK

Port Largo Resort in Key Largo, Florida was developed for those discriminating traveling divers seeking more than just a room for the night. Recognizing that convenience, fine amenities and access to quality diving are the critical components of the dive vacation package, developers Stuart and Scott Marr selected a location on a deep water canal. It's just a short boat ride from the spectacular diving available at the south end of Pennekamp Park. Twenty-eight, two bedroom, two bath suites and two, one bedroom, one bath suites were erected on the property. It was lavishly landscaped and marketed specifically to the traveler seeking a full service dive resort.

The units are close to the main shopping area of Key Largo, just a few blocks off U.S. 1, the primary traffic artery of the Florida Keys. Once on the grounds of Port Largo Resort, the bustle of the highway and noise of travel are forgotten. There are lush tropical plants and lots of greenery all around, as well

Jewel Of The Keys

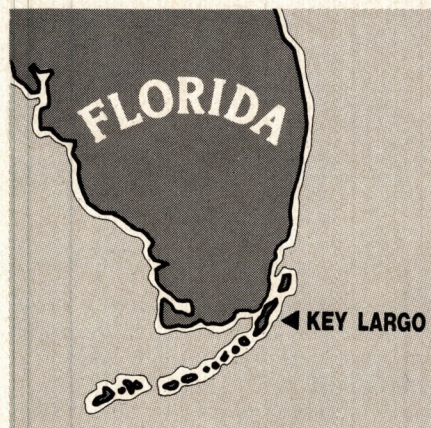
as two swimming pools, tennis courts, a waterfront lounge with video center and live entertainment and newly refurbished fitness spa with Universal and free weights. All of these are available to guests at no extra charge. The suites are sumptuously decorated and are available for nightly or short-term rental. Each has central air conditioning, wall-to-wall carpeting, color cable TV, cedar balconies and fully equipped kitchens including cooking utensils and appliances. The linens, hairdryer, washer and dryer and even the corkscrew are all there, providing a complete vacation retreat.

Over 1.5 million watersports enthusiasts visited Key Largo in 1984 to enjoy the fine diving and fishing available. Those who chose to stay at Port Largo Resort had to go no further to find professional charter services. Key Largo's fringing reef structures are five to six miles offshore, but both commercial and pleasure craft are available at Port Largo to transport vacationers to the reef. In fact, a professional dive shop and marina facility, Ocean Divers, operates directly adjacent to Port Largo Resort. It offers daily reef excursions to Pennekamp Park, air fills, underwater camera rentals and sales, film processing (E-6 and color

prints), scuba instruction and retail sales. U/W photo instruction with Stephen Frink is offered three times during the summer months and other PADI specialty courses are frequently conducted.

A new service for 1985 is for the more adventurous diver who is somewhat familiar with the waters of Pennekamp Park and wishes to captain his own vessel. Club Nautico features ten, 25 foot Welcrafts especially equipped with tank racks, dive platform, VHF radio, cassette stereo, depth sounder, convertible top and a roomy cabin with head and galley. Each is powered by a 155 hp outboard capable of cruising from the docks to Molasses Reef in less than 25 minutes.

Whether by private boat, rental boat or commercial charter, the diving in Pennekamp Park, just minutes away, is exciting. Fish populations are prodigious and quite friendly, making Pennekamp waters superb for fish photography. The corals are generally high profile, in a spur and groove configuration, with water clarity ranging from 30 to 100 feet and temperatures ranging from 68 to 88°F. The park is a marine preserve with more than 100 square miles accessible to the diver. Since most of the reefs are in the 10 to 30 foot depth range, Pennekamp is ideal



for snorkelers too.

Port Largo Resort is admittedly expensive for just one or two guests as compared to the other hotels in town since the unit is the same cost whether one or six people occupy the suite. The cost per person is quite reasonable: With four to six people in a suite, Port Largo Resort is one of the best deals in town. Even greater price advantages may be realized by booking the dive/lodging package with Port Largo and Ocean Divers as compared to either service booked a la carte. Still, for a majority of travelers, it is more convenient to travel alone or as a couple and it is for this market that Phase II is being constructed.

Underway is a magnificent new complex to be four stories high with elevator, restaurant, shopping, an expanded cocktail lounge and upgraded fitness spa. There will be an additional 48 units with 16 suites with a maximum capacity of four people and 32 double rooms. Each unit will have either a marina view or a view of the landscaped villas and Atlantic Ocean. Projected completion date is December 1 of this year. But don't worry about booking this year's vacation into a construction site. The new units are completely separate from the existing villas and the management is insistent that there be no interruption of service or inconvenience to its guests.

If the concept of providing an upscale accommodation to a discriminating consumer were not valid in the Key Largo marketplace, Port Largo Resort would not be enjoying its remarkable success, nor would it be expanding. The whole flavor of the resort is watersports, with heavy emphasis on scuba diving. The units will have underwater photography as decor and the video lounge will feature underwater tapes of the best of Pennekamp diving. Convenience and quality, coupled with professional service, have been integral to the growth of Port Largo Resort. For further information or reservations contact P.O. Box 1050, Key Largo, Florida 33037 or phone toll free (800) 451-DIVE. Florida residents may call 451-4107.



Right: The weight room at Port Largo Resort. Above: a snorkeler with French angelfish. The abundant fish of Pennekamp Park, just minutes from Port Largo Resort, are perfect for photography.

DAN CAN

Fund Raiser For Divers Alert Network

BY JOE CHAMBERS

The Aqua-Nut Divers' Fourth Annual Treasure Hunt had been in the planning stages since January 1, 1984. By the weekend of Our World-Underwater, May 4-6, almost all of the details had been finalized and the promotion of the event was well underway.

While touring the Our World-Underwater booths, I had a conversation with Chris Wachholz, assistant director of DAN (Divers Alert Network). At that time I realized we had an opportunity to not only distribute literature and information for DAN, but to make a financial contribution as well. The question was . . . how? The Treasure Hunt agenda was set. The money raised from entry fees would be needed to cover the costs of promotions, food for the Saturday Hog Roast, printing costs and the canvassing for the more than \$4,000 in prizes to be given away.

Obviously, some creative adjustments were in order if we were to help DAN during the Treasure Hunt. It began with an idea for a DAN-Can, a separate fund rais-

ing system designed to benefit only the Divers Alert Network.

The weekend's activities drew about 250 people from six Midwestern states, with 107 of those participating in the Treasure Hunt itself. The fund raising for the DAN-Can began at the Hog Roast. Divers participating in the Treasure Hunt on Sunday were treated to a barbecued hog cook-out on Saturday night. Those not participating in the hunt, but wanting to eat with the divers, could do so by making a \$1 donation to the DAN-Can.

We also pulled out the prize packages which donated a service and required the winner to travel to contributors' businesses to collect their prizes (i.e., free diving and lodging packages). These were offered in raffles for a \$1 per ticket donation to the DAN-Can. Sales went much better than expected. By the end of Saturday evening's activities, we had already raised over \$200—and Sunday's big crowd had yet to arrive.

By the beginning of the Treasure Hunt

itself, we had distributed the remainder of the service-related prize packages and raised an additional \$100 for DAN. We had expected as many as 150 divers. With the prize awarding out of the way and all of our 107 participants walking away with prizes ranging from a \$5 "I'd Rather Be Diving" 12 oz. mug to a \$500 PI-1000 Underwater Metal Detector, we found ourselves with an extra 43 prizes. One of those happened to be a man's \$375 dive watch. The stage was set: We had a great prize, a crowd of over 200, and you guessed it, we had our DAN-Can. Not only was the watch raffled off, but the other leftover prizes were also raffled off at \$1 per ticket to the DAN-Can.

All said and done, the Treasure Hunt paid for itself and pushed our club membership up to 137 members. We were also able to send a check for \$600 to the Divers Alert Network.

The DAN-Can was such a success that we have decided to take it to all of our future club meetings and dives. DAN also has some additional ideas for you, your club and your dive shop. For more information on how you can help the Divers Alert Network contact: Chris Wachholz, Assistant Director—DAN, Box 3823, Duke University Medical Center, Durham, North Carolina 27710. If you would like more information about our next Treasure Hunt or the Aqua-Nut Divers, contact: Joe Chambers, R.R. # 1, Box 153-C, Clinton, IN 47842; or call (317) 832-9930.



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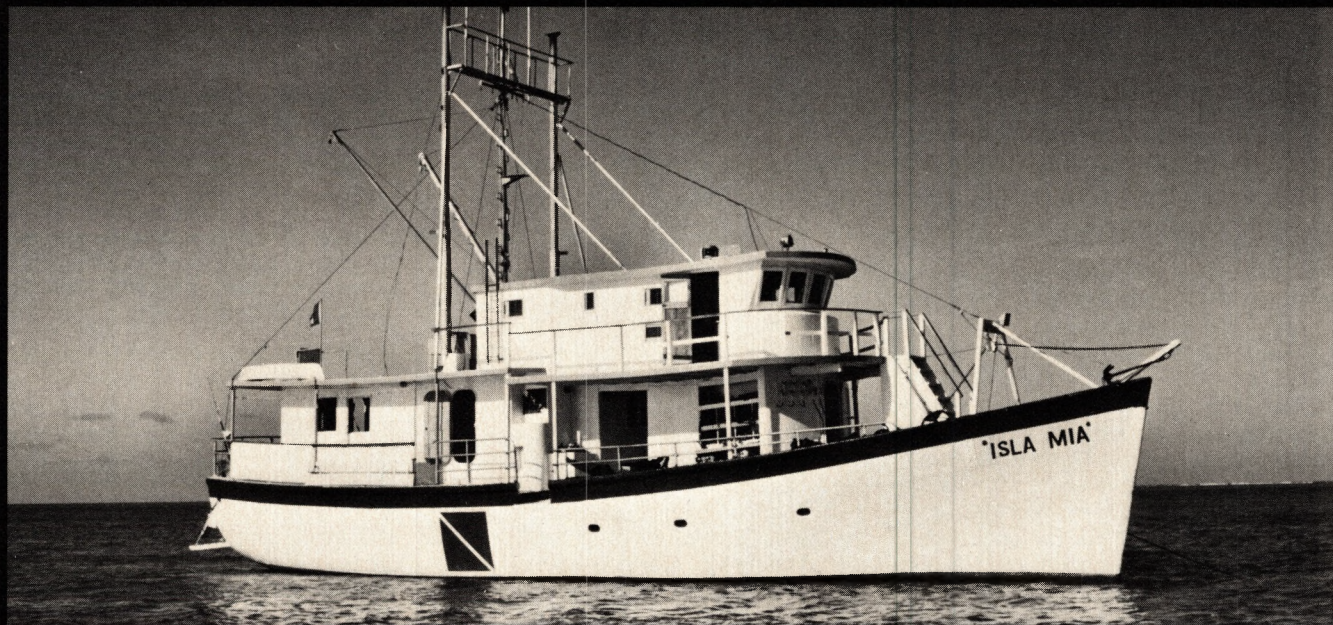
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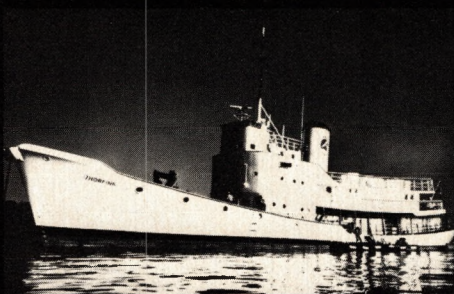
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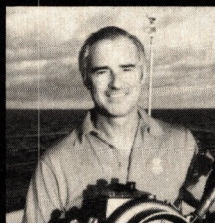
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TEXT AND PHOTOGRAPHY BY HERB SEGARS

Angered at his rudeness, rose the the mighty whale; "Thwack!" upon the Flounder smote that dreadful tail; made him a pancake, deep upon his face, like a butter pattern, stamped that weird grimace! That's the way it happened; that's the reason, honey, why the poor flat flounder looks so awful funny!

—Arthur Guiterman*

The above is a fitting description of this member of the flatfish family and to many divers it is just as believable as the flounder's true development cycle.

The northern fluke (*Paralichthys dentatus*), also known as the summer flounder, is one of the peculiar oddities of nature that makes up the subsea community. It is a member of the flatfish family as are the numerous other species such as the winter flounder, southern flounder, peacock flounder and the halibut. Distinguishing characteristics of these fish are: their flat, oval shape; camouflage coloration on the top portion of the body; white or off-white coloration on the underside; and both eyes on top of the body.

On its upper side, the fluke is brown or gray with tints of orange, pink and very dark brown. Most are marked with dark spots surrounded with a white margin. They possess a chameleon-like ability to change their color and perhaps even their spots to match the bottom on which they are lying. This is attributed to special pigmented cells called chromatophores in the fish's skin. These cells are regulated by nerve and hormonal stimulation based on what the fluke sees. In tests, specimens have been placed on dotted and checkered patterns and have made remarkable attempts to duplicate them.

Even more unusual is the metamorphosis that takes place in the fluke during its development stages. In the first five to seven weeks after hatching, flukes have an eye on each side of their heads and swim upright like any other fish. Sometime after this they start to swim on one side or the other, while staying on or close to the bottom. The top of the fish begins to take on its natural color scheme while the underside pales to white. Almost incredibly, the eye on the underside of the body begins to migrate to the upper side. Throughout this journey, the optic nerve remains intact!

Around the end of April or during the month of May, fluke begin their migration from the deep waters that they inhabit during the cold winter months. Into the shallow waters they come, moving into the bays and rivers, much to the delight of the commercial and recreational fishermen. While fishing for fluke may be fine, spearfishing is even more rewarding.

Smiles are hard to remove from a diver's face as he/she wades into the water while fishermen line the shore shoulder to shoulder—no worries about the fish not biting or snagging lines in the rocks. It is a game fish readily caught by even the most inexperienced diver. The fluke's oval shape is usually easy to distinguish on the bottom, providing a large target for the hunter.

Fluke range from Maine to South Carolina but are most common south of Cape Cod. They spend their summer months in the warm, shallow waters feeding on small fish, crustaceans and other shellfish. They bury themselves in the sand with only their eyes protruding and wait patiently for their prey. At the sight of a tasty morsel, they spring to life and pursue their adversary. In the excitement of the hunt, fluke have been observed following small fish to the surface and jumping clear of the water.

For fluke, the flat, sandy bottom off the New Jersey coast is ideal. The nutrient rich summer waters provide an abundance of food for the flatfish, who thrive and grow in this near perfect setting. Divers are rewarded with catches taken from almost any entry point, be it beach, jetty or boat.

Quite often, the fluke is confused with several other species of flatfish that frequent the same areas. The most common is the winter flounder (*Pseudopleuronectes americanus*). At first glance, the two fish seem impossible to distinguish between, but placed side by side, the differences emerge. The fluke is a left-handed fish with its eyes on its left side. It possesses a large mouth with prominent teeth and has 85-94 rays in its dorsal fin. The winter flounder is a right-handed flat, with its eyes on the right side of its head and it is equipped with a tiny mouth and a dorsal fin with 60-76 rays. The fluke grows larger than the winter flounder, sometimes reaching a weight of 20 pounds or more. When over ten pounds, they are affectionately called *doormats*! Every year a number of these large fish are taken by overjoyed divers or fishermen. Record-breakers in the 25-30 pound range have been recorded.

A word of caution to new divers in search of *doormats*: On the sandy flats near offshore wrecks, there is another fish that disguises itself much the same as the flounder. Lying partially covered with sand, awaiting its dinner, is the goosefish (also known as the headfish or allmouth). It is very large and very aggressive, so much so that a speared fish can be more than most divers would want to handle. Take a minute and study the outline of the fish; the differences between the two are readily discernible. The goosefish has a much rounder head with a very large mouth.

To the divers' delight, the fluke remains in the shallow waters along the coast for

BASIC PREPARATION

After gutting, dress and cook smaller fluke whole. Cut larger fish into fillets, with or without skin.

SAUTEED FLATFISH FILLETS


Take the fillets or the cleaned whole fish and dip in egg, coat lightly with flour, season with salt and pepper and quickly sauté on both sides in hot butter (vegetable oil or shortening may be substituted) until the fillets are white and tender on the inside and slightly golden and crispy on the outside. Arrange the fish on a platter, sprinkle with lemon juice and chopped parsley and serve with tartar sauce or hot melted butter.

the entire summer. At the end of October it migrates into deeper offshore waters. During the winter months, it is believed the fish spawns. Because of the depths frequented by the wintering fluke (150-500 feet), information on the spawning process is sketchy.

Throughout its inshore visit, the flatfish provides food for a large number of individuals. Commercially it is harvested and sold in seafood stores and restaurants, often called fillet of sole. Recreationally, it is taken by fishermen and divers—the latter scouring the sandy bottoms in the inlets, bays, around jetties and wrecks and off the beaches in search of this delectable creature.

Most divers use a handspear with a barbed end or a sling type spear with a paralyzing tip, the latter being the most popular. Spearguns are not used for a number of reasons; one of which is ruining the tip of the spear when it strikes the sandy bottom. Another more important consideration is the low visibility found in flatfish territory. Drifting over a suitable quarry, the diver readies the spear and takes aim. Shortly thereafter, the fluke is on its way to fulfill its destiny as part of nature's food chain.

There are currently no restrictions on the taking of fluke. Therefore, discrimination by the diver is of prime importance. The fluke is an excellent fish for those divers who are new to the sport of spearfishing, providing instant success. An interesting comparison between spearfishermen and fishermen exists. Spearfishermen can be selective in their choice of targets, leaving the smaller fish to grow unhindered; while fishermen, through no fault of their own, cannot regulate their catch, often hooking undersize fish.

The ultimate joy of the incredible, edible fluke is most certainly the edible part. The large flatfish produces a firm white meat that is easy to prepare. Most seafood cookbooks have an abundant supply of recipes but one of the easiest and tastiest can be found in our sidebar. 

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Top: The northern fluke (*Paralichthys dentatus*) can alter its pigment to match its surroundings. Right: Divers ready to enter the water and hunt for flatfish. Above: Proper flatfish hunting gear includes a float and dive flag for safety. Inset: A gourmet dinner of fresh fluke.





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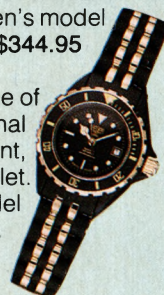
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ARTIFACT PRESERVATION

**How To Keep What You
Found Diving—In At Least
The Same Condition**

BY RIC MURPHY

You've had a great day's diving. Your goodie bag is jammed full with a variety of assorted items you have retrieved, at no little expense or risk to yourself. You take them home, wash them off and proudly display those that are your favorites. Days pass, maybe weeks. You go to show your little treasures to your newest captive audience and you discover that that neat little knife with the carved wooden handle is now just a rusty blade and a chunk of dried, cracked wood or that old leather shoe is now a dried and brittle

piece of unrecognizable crumbly stuff. Now what? Toss them out or relegate them to the garage or attic? That's what usually happens. I've even seen divers dump objects that have dried out back into containers of water, hoping they will reconstitute themselves like some kind of freeze dried fruit. It won't work!

Some time ago I was directing the excavation of a Revolutionary War ship in the St. Lawrence River when one of the local divers approached me with guarded caution, the way most divers approach

archaeologists. He showed me a picture of an old musket he had retrieved from the depths of Lake Ontario. He didn't bring the piece itself as he was afraid I would claim it in the name of archaeology, the state or some other authority and he would never see it again. Not so! First I explained to him I had been an avid diver for more than 10 years before I went back to college to get my credentials in archaeology and therefore my sympathies were with him, not the bureaucracy.

The photo he showed me was of an

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ARTIFACT PRESERVATION

English Brown Bess model musket in a fantastic state of preservation from resting in the mucky, very cold, anaerobic environment of Lake Ontario. I had set up a small field laboratory to handle the artifacts from our project and I told him that I would be more than glad to treat his piece in exchange for the information I could gain from it and nothing else. I told him to keep it in the water until he could bring it back into the lab. Well, he showed up a couple of weeks later carrying a plastic garbage bag full of water and some pieces of wood and metal that at one time were a Brown Bess musket, but you could hardly call it that anymore. He then informed me he had actually found the artifact the year before and it had completely dried out for most of that time while resting on his mantel. I really felt bad: There was nothing I could do. I had been hoping to talk him into letting the local historical museum put it on display after it was treated, but that was out of the question now. What had been a really fantastic find was now worthless junk.

That story and variations of it have occurred over and over again with the same sad ending throughout my career. And, the destruction of these objects could have been easily avoided by simply keeping them wet until they could be treated. The best advice you'll ever get concerning the care of objects recovered from a fresh or saltwater environment is simply; keep it wet! You will ensure its safe keeping until it can be treated or you may just display it that way. You may have to add fungicides or pesticides, depending on what sorts of strange things are making a home in or on your little treasure, but in most cases even these are unnecessary unless the object is badly infested or will be stored for long periods of time.

So now you've got it. You didn't break it apart digging it up and it didn't get smashed when you threw your goodie bag in the boat. You've provided a suitable, watertight container to carry it in. It's whole and it's wet. So far you're way ahead of the game. Now what do you do? You don't want to keep it in a glass case full of water. You want to be able to pick it up, show it off, let people handle it and admire it. Hopefully you will be interested enough to do a little research on the object. Find out just what it is, where it was made and when. What you do next depends on exactly what it is you have recovered. Obviously you can't haul a tank full of water containing your artifact to the local library but you can take photographs. Providing the article will stand handling you should be able to get some good black and white photographs to

work from. Remember, if you take the object out of the water to photograph it, make sure it doesn't stay out so long it begins to dry out. Leave it in the water except for when you are actually taking the pictures. Work with the photos. The less you handle the artifact the better.

Now suppose you've done all that and decided that it is worth the time, expense and trouble to treat so it can be handled safely and displayed in the open air. If you don't know how to treat it, don't. When in doubt do nothing! Poor or improper treatment can cause irreparable damage and in some cases complete destruction of the artifact. Don't experiment on your own. More harm is done by improper treatment than by no treatment at all and in most cases an artifact that has been improperly treated can never be restored. Just keep it wet!

There are a few laboratories in the U.S. and Canada that specialize in treating artifacts that have been underwater but they are government or state owned and do not treat objects submitted by individuals. Some of them do put out some publications on artifact treatment. The most comprehensive of these is a booklet published by Marine Archaeological Research Services Inc., 519 Watervliet Shaker Rd., Latham, NY 12110. The procedures outlined in it were developed from research carried out at the State University of New York at Albany and most of them can be done in a small home workshop.

Most commonly found objects can be treated at home in your basement, garage or even your bathtub (if you don't plan to use it for a month or so). But beware! There is no instant cure-all method. You can't reverse natural processes that have been going on for years by one quick, overnight treatment in your kitchen sink. Preservation or conservation as they like to call it now, takes time—lots of time, sometimes months. So, first you must find a place in which to work that is not likely to be needed for anything else for quite some time.

While it is not possible to explain in detail the procedures to follow to preserve every type of object you might find, I will at least explain a relatively simple procedure for treating iron and other ferrous metal objects. These are among the most commonly recovered items.

Iron and steel artifacts can be very difficult to preserve owing to their natural rapid rate of oxidation, especially in the presence of chlorides, as in seawater. But there are several methods that can be used that do not require large, expensive laboratory facilities. These include rust and corrosion inhibitors, various acid treatments, sealants, chemical and electrolytic reduction and encapsulation.

Generally, ferrous metal artifacts are manually cleaned to remove rust globules, barnacles and other foreign debris. This may be done by carefully

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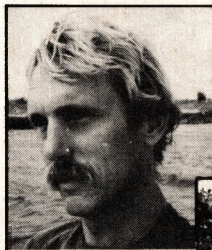
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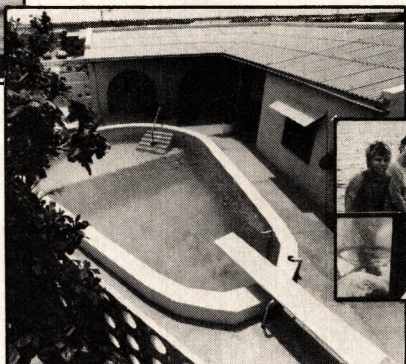
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ARTIFACT PRESERVATION

picking, chipping and brushing under running water. Go easy. It may be metal but treat it as if it were glass. Don't be concerned with removing every bit of foreign matter. At this point you are only trying to determine exactly what you have to work with and what state it's in. It may well be the only thing holding your ancient relic together is the corrosion and encrustation. In some cases it will be obvious the item is so far gone no amount of work will ever restore it. Or, it may just be in such fragile condition under all the encrustation that it could not stand by itself if this was removed. In that case it is only necessary to stop any further deterioration from taking place. Carefully brush away all loose sand, sea life, rust and other foreign matter. A good, commercial rust inhibitor may then be brushed on. Be sure to cover all exposed metal heavily. Dry the item, an ordinary kitchen oven will do, for about 12 hours at 210 °F. Then remove it and brush away any dried or burned particles. The final step is to coat the object with clear fiberglass. The number of coats may vary with the object but a minimum of six is suggested.

Bulkier or sturdier items may be sand-blasted to bare metal and washed in alternate baths of hot and cold distilled water. If the item has been recovered from saltwater, tests must be carried out to determine if there are chlorides still present. This can be done by adding four or five drops of silver nitrate to a sample of the last rinse water. If chlorides are present the water will turn milky white. If it does, continue the washings until the test is negative. A rust inhibitor should then be brushed on liberally or if possible, soak the object in rust inhibitor. Whichever way you do it make sure you get the rust inhibitor on fast and heavy. Bare metal, when exposed to the air, begins to oxidize rapidly. So if you don't get at it right away and cover all exposed metal you are going to have a rust problem sooner or later.

The next step is largely a matter of individual taste. If you're a purist and have a burning desire to come as close as possible to the original finish, all you need do is heat the object until it reaches a temperature where linseed oil will smoke and turn black when rubbed into its surface. Keep heating it and rubbing linseed oil on and into it until it turns black. That's how the old blacksmiths used to do it and it still works. However, if you aren't that particular (most people aren't) and you want to avoid the danger of burning your hands and the mess and smell of hot linseed oil, an acceptable finish can be achieved by painting the object with a rust inhibiting paint. There are several brands available at most hardware

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stores. Any of them will do and if you're not into black at least you'll have a wide choice of colors to choose from. When you have the object coated or painted and it has dried, apply a protective coating of epoxy resin or clear fiberglass.

Iron and steel objects that are not bulky or sturdy enough to withstand sand-blasting, but not so fragile they will come apart under treatment, should be treated by electrolytic reduction. Don't let words scare you, it's not as complicated as it sounds. In my opinion, it's far safer and much more controllable than chemical or acid reduction treatments. Acids are dangerous even under laboratory conditions and most of them don't know when to quit. Electrolytic reduction is a very slow, controllable process and there is little danger of damaging the artifact if you pay attention to what you're doing. However, if you are one of those people with two left thumbs, who can't boil water without burning it, I'd advise you let someone else do it.

Before you go through all the trouble of setting up your electrolytic reduction tank, first clean the object under running water as described previously. You must remove enough of the surface encrustation to be able to make a good connection to the bare metal itself. Don't try to remove it all, just enough so that bare metal is exposed on one small section. Let the electrolytic reduction process do the work. It's slower but it's much safer and far better than anything you could do by hand. While we are still on the cleaning stage I should warn you it is best to do this work dressed in old clothes, wearing gloves and in an area you don't mind getting filthy. It's a dirty job and best done outdoors if possible. It's also a good idea to wear a pair of safety glasses while you're picking and chipping. Make a careful examination to determine if the artifact can withstand the treatment. If it does not have a solid core then the process may be hopeless. If it is in good, solid condition under the encrustation you're all set.

Putting an electrolytic reduction tank together takes longer to explain than it does to actually do it. First you'll need a container large enough to hold your artifact. A plastic pail or wastebasket will do in most cases as long as it is watertight and will hold the artifact. Lay a metal rod across the top of the pail and suspend the artifact from it using copper wire. If the piece is heavy you may want to secure it with two strands or more of copper wire. Next, mix a solution of 5 percent sodium hydroxide (caustic soda) and 95 percent fresh, clean water. Distilled water is best as it is purer than tap water and contains no added chemicals or minerals. Submerge the artifact in the liquid completely. From a separate metal rod suspend a small piece of stainless steel from a copper wire so that it, too, is submerged in the liquid but make sure it will

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ARTIFACT PRESERVATION

not come in contact with the artifact. A small scrap of stainless steel will do the job nicely as will an old butcher knife blade or anything else that has a few square inches of surface metal.

Next you will need a rectifier (a common automobile battery charger will do nicely, providing it has a dial by which you can control the amperage). Most chargers put out more amps than you need. For example, a 3,000 pound cannon can be treated using only two amps or less and a small metal object requires a great deal less. Connect the negative lead from the charger to the metal rod holding the artifact and the positive lead to the rod holding the stainless steel. Plug it in and slowly turn up the amperage control dial until you see small bubbles coming from the artifact's surface. This should take place almost immediately. If several minutes go by and nothing happens, recheck your connections to make sure you have good metal to metal contact. After the artifact has been in the pail for a couple of hours check your bubbles again. If the action taking place has increased considerably turn your amperage dial down to a lower setting. You want a slow but steady action taking place in the pail, not a fast or violent one. At high amperage settings the artifact will get clean, all right, but remember this a *reduction* process and if too fast and too violent it can't be properly controlled. The artifact may be damaged or destroyed if left for any extended period of time—faster is not better in this case. During the course of electrolytic reduction it is necessary to remove the article being treated from time to time to manually remove loosened corrosion and to check for any markings that may have become evident. If any markings do become visible you should photograph or draw them immediately if you intend to do any research on the item. A maker's mark or touch mark, will allow you to pinpoint the piece to a specific time and place of manufacture. Don't assume that because the mark becomes evident during the process that it will be there when you are finished. Very often the corrosion extends so deeply into the metal that once it is entirely removed so are the markings. The sodium hydroxide solution should be changed after two days and replaced with a fresh solution to get rid of the chlorides and wastes that accumulate.

How long you leave the item in the process depends on its condition and size. A 3,000 pound iron cannon can take up to six months to complete, smaller items, a few days to a few weeks. Only you can decide when to stop the process. Check the condition of the artifact at frequent

(Continued on Page 119)

Diving News From Down Under

New Area Of Great Barrier Reef Opens

TEXT AND PHOTOGRAPHY BY GERI MURPHY



The live-aboard dive boat *Auriga Bay* will make several trips this fall to the remote northern end of the Great Barrier Reef. Barry May (below left) has spent two years exploring this area and charting dive sites. Below right: Meal time on the *Auriga Bay*.



FAR
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BARRIER
REEF

Barry May, one of Australia's best known dive boat skippers, has just announced the opening up to divers of a new area of virgin reefs at the remote northern end of the Great Barrier Reef. The area is approximately 375 miles (600 km) north of Cairns, the last major seaport city on the Queensland Coast. May explains, "This area is where the outer Barrier Reef drops directly into the Coral Sea basin. Here, you have the potential of the crystal clear Coral Sea combined with the immense variety of marine life found on the Barrier Reef. The colors of the corals are rich and vibrant, probably owing to the water temperatures so close to the equator."

May has devoted two years to exploring and charting of the formerly inaccessible reef area. He has scheduled four live-aboard dive boat charters to the area during 1985. Two departures will occur in September, one each in October and November. All four trips are during Australia's prime diving season.

Visitors to this remote region will fly to the aboriginal settlement of Lockhart River and then travel overland by bush road to the seacoast settlement of Portland Roads. The live-aboard dive boat being utilized for this venture is the *Auriga Bay*. The dive trip will last from 11 to 12 days, depending on specific departure.

Barry May is regarded as one of Australia's leading pioneers in the development of dive tourism. He has devoted the last ten years to the design of Australia live-aboard dive boats. He is well known to American divers, having attended numerous DEMA shows and underwater film festivals in the U.S. May is presently the president of Reef Explorer Cruises, the charter company which operates both the *Auriga Bay* and the *Reef Explorer*.

For more information about these new Far North Great Barrier Reef Trips, contact: Dive in Australia, 680 Beach St., Suite 340, San Francisco, CA 94109; telephone (415) 928-4480. >

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Watch Out For The **BOTTLE BUG** There's No Escape!

**TEXT AND PHOTOGRAPHY
BY CHARLES A. McCLURE**

Keeping divers diving has always been a bit of a problem from an instructor's or equipment manufacturer's point of view. After the diver has earned all the levels he/she can and has purchased all the equipment needed, he/she has then reached the level of "What do I do now?" Unless the diver finds an interest that will keep him/her diving, he/she will stop.

Collecting old glass, as it is politely known (old bottles, if you wish to be de-classe) can be a very enjoyable pastime or hobby. Old dumps are a prime source of old glass. However, the availability of old dumps is pretty well limited and the ones that are around, and there are a few, are closely guarded secrets.

An essential part of successful bottle hunting is to research the area you wish to explore. Determine the areas where people congregated, for instance, the town docks. Many of the old docks, hotels, boarding houses and other points of interest have been torn or burned down and all physical evidence of the actual structures has all but disappeared. However, the bottles and collectibles are still lying on the bottom today, just waiting for the eager diver to find them.

Find out where the popular beaches were, for on these, boat rentals and rides were available. Picnickers and holiday-makers traditionally bring all kinds of goodies with them, but don't always take them back.

Boarding houses and hotels on the beach dumped their garbage in the lake before they had community dumps to dispose of it. Find out which old towns were hubs of activity—say 80-100 years ago—and start looking around. Many bottles have been found in the ankle deep water of mill ponds and small streams that run through smaller villages.

The location of today's garbage dump may be an indication of the location of old dumps, as sometimes they were very close to one another. Another source is to ask the old-timer if he can remember where the old dumps were. The cost may be minimal, perhaps a bottle of beer or a glass of wine in the local pub.

Finding an old bottle is rewarding and the fact that you can place it on your mantel at home and appreciate what it is is doubly rewarding. You can look at it and

THE WORLD IS SPLIT IN TWO!

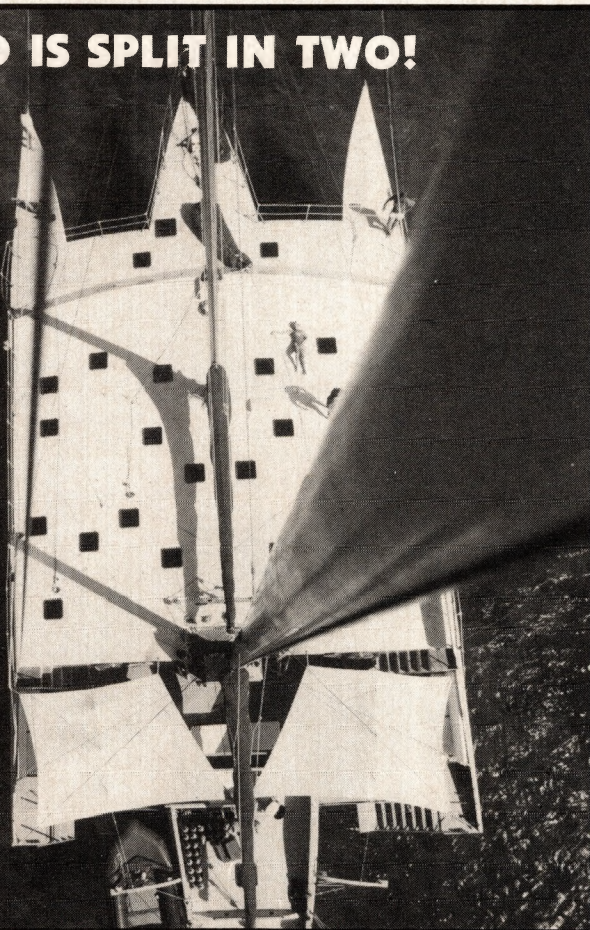
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think about where you found it, where someone, many years ago, had thrown it away and that it had remained undisturbed until you brought it up. The questions jump into your head: Who threw it away? Why did they throw it away? What were they doing—picnicking, sailing? Where was the bottle bought? What was in it? Many bottles were salvaged and reused by companies or manufacturers other than the one who had the bottle



made in the first place, so a little bottle knowledge is desirable.

Bottle collecting is a disease. Once you have contracted the bottle bug, there is no escaping its clutches—the thrill of the hunt, the excitement of the find, the joy of ownership. So, arm yourself with a bit of knowledge, a whole lot of perseverance and a whole bunch of luck and set out to find that elusive bottle. Good hunting.



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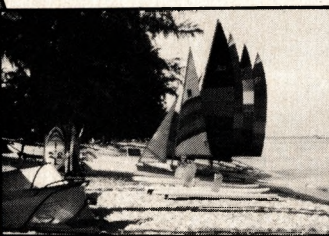
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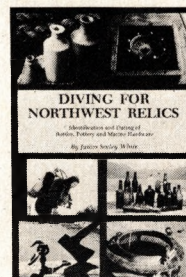
The Mariner's Guide to OCEAN- OGRAPHY

Edited by Nixon Griffis

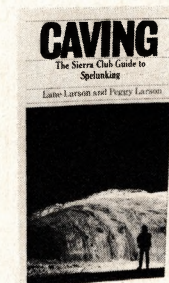
Line drawings by Doreen Saccupoli

Hearst Marine Books, New York, NY

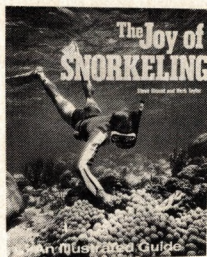
The Mariner's Guide to Oceanography—Edited by Nixon Griffis, this book contains 18 chapters, authored by experts in specific areas, from sharks (Richard Ellis) to seaweed (Dr. Sylvia Earle). \$17.95. From Hearst Marine Books, 105 Madison Avenue, New York, New York 10016.



Diving for Northwest Relics—By James Seeley White, this book contains many photos of ships' relics, bottles and pottery recovered by the author in the Pacific Northwest. Information on collecting techniques. \$5.95. Binford & Mort Pub., 2536 S.E. 11th Ave., Portland, OR 97202.



Caving—This Sierra Club Guide by Lane and Peggy Larson covers the sport of caving in detail. One chapter is devoted to cave diving and covers springs, siphons, sinks, currents, silting, etc. \$10.95. From Sierra Club Books, 2034 Fillmore St., San Francisco, California 94115.



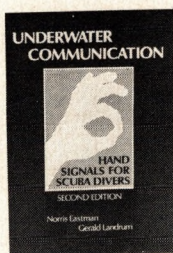
The Joy of Snorkeling—By Steve Blount and Herb Taylor, this handy guide has photographs and diagrams illustrating equipment and techniques relating to snorkeling. Brief coverage of scuba diving is also included. \$8.95. Pisces Books, P.O. Box 678, Locust Valley, NY 11560.



Sierra Club Guide to the Natural Areas of California—By John Perry and Jane Greverus Perry, this guide describes wilderness sites. Each is keyed with symbols indicating the recreational opportunities available. \$9.95. Sierra Club Books, 2034 Fillmore St., San Francisco, CA 94115.

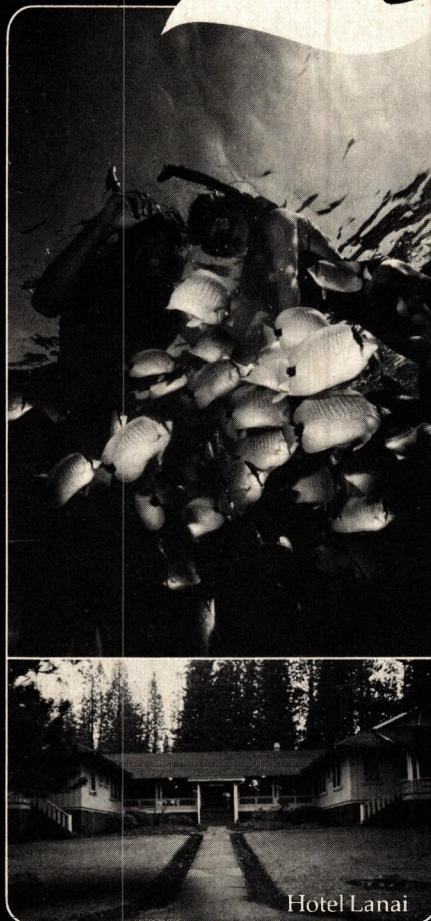


Walking Softly in the Wilderness—By John Hart, this revised Sierra Club Guide to Backpacking discusses: gear, hiking, hazardous plants and animals and first aid. Stresses low impact on the environment. \$8.95. Sierra Club Books, 2034 Fillmore St., San Francisco, CA 94115.



U/W Communication—This second edition by Eastman and Landrum contains 130 hand signals in six categories—fundamental/instructional, emergency/safety, environmental, marine life, numerical and fingerspelling. \$3.95. Princeton Book Co., P.O. Box 109, Princeton, NJ 08540.

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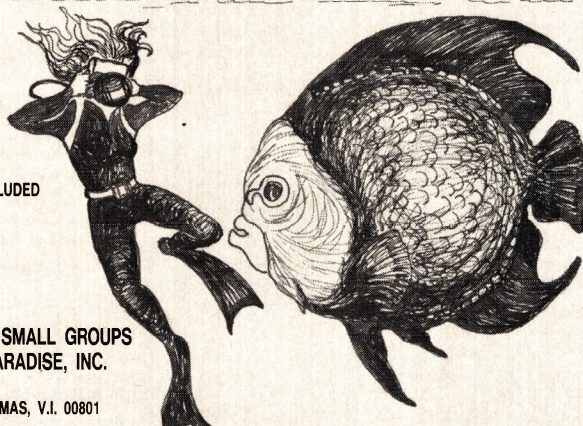
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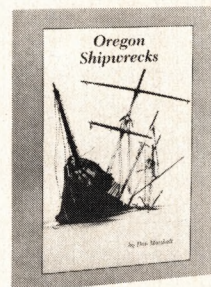
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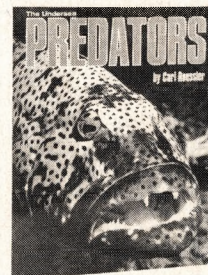
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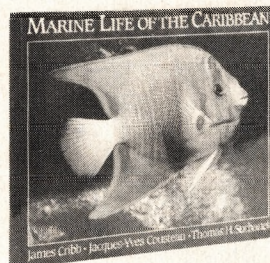
Sports Illustrated Scuba Diving—Written by Hank Ketels and Jack McDowell, this book begins with a brief history of diving and continues to discuss aspects of scuba diving including: physical fitness, equipment, physics, physiology and others. \$8.95. J.B. Lippincott Co., New York.



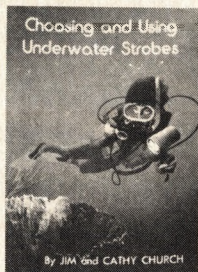
Oregon Shipwrecks—By Don Marshall, this book covers more than 200 years of ship disasters along Oregon's coast. It gives accounts of the events leading up to each sinking. Many black and white photos. \$24.95. Binford & Mort Publishing, P.O. Box 42368, Portland Oregon 97242.



The Undersea Predators—Featuring more than 200 exciting photos by author Carl Roessler, this book describes marine animals from tiny corals to reef fish to huge sharks. \$24.95 (\$45 deluxe binding) plus \$2.50 shipping. Pisces Books, P.O. Box 678, Locust Valley, NY 11560.



Marine Life of the Caribbean—Featuring the full color photography of James Cribb, this book also contains an introduction by Jacques Cousteau and captions by Thomas Suchanek. Marine animals are examined. \$15.95. Skyline Press, One Pleasant Ave., Port Washington, NY 11050.



Choosing and Using U/W Strobes—This latest guide by the Churches is divided into six chapters: choosing a strobe, correct exposure, close-ups, using your strobe, multiple lighting techniques, and strobe care. \$7.95. From Jim and Cathy Church, P.O. Box 80, Gilroy, CA 95021.

The Sierra Club Guide to the Natural Areas of OREGON and WASHINGTON



Sierra Club Guide to the Natural Areas of Oregon and Washington—By John Perry and Jane Greverus Perry, this book describes the outdoor opportunities available in these two states. More than 250 entries. \$9.95. Sierra Club Books, 2034 Fillmore St., San Francisco, CA 94115.



Diving and Snorkeling Guide to Grand Cayman, Little Cayman and Cayman Brac—Describing the best dive sites off these islands, this guide by Carl Roessler and the editors of Pisces Books includes information on beaches, accommodations and night life. \$8.95. Pisces Books.



Living and Working in the Sea—By James W. Miller and Ian G. Koblick, this book traces the progress of man's attempts to work beneath the sea from ancient Babylonia to modern underwater habitats. \$32.95. Van Nostrand Reinhold, 135 West 50th St., New York, NY 10020.

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Sea-Lite

**Compact, rechargeable,
foolproof u/w handlight**

BY JIM WALKER

Foolproof and unconditionally guaranteed: Anything described by these adjectives is a diver's dream come true. If you add inexpensive to these descriptive terms you have an irresistible item, such as the Sea-Lite from El Mar Corporation. For just \$19.95 you get a compact, rechargeable, foolproof underwater handlight that is unconditionally guaranteed for one year.

The Sea-Lite is only five inches long and tapers from two inches in diameter at the lens to one and one-quarter inches in diameter at the end cap. It weighs only 4.6 ounces out of water and floats beam up in water. It's small enough to fit in most BC pockets. Fully charged it will burn for 40 minutes to an hour in continuous operation and much longer if used intermittently. The central core of its beam is about ten inches in diameter at a distance of five feet, above water, and smaller at the same distance underwater. Thus, the beam is perfect for use as a small flashlight topside and for looking into crevices, as a modeling light attached to a strobe or as a backup light underwater. For the night diver interested in preserving night vision by confining his/her primary light beam to a small area, it's also useful.

What makes the Sea-Lite foolproof is that it is sealed at the factory. The orange, foamed polyurethane body is permanently bonded to the clear, Lexan lens and black, ABS plastic butt with all electronics inside. There are no through-housing switches or O-rings. The Sea-Lite is pressure tested to more than 100 feet and its tough casing is resistant to acids, oils and rough handling. The front of the light is additionally protected by a lens ring of soft, black plastic.

The Sea-Lite's on/off switch is operated by turning the butt cap. This, in turn,



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rotates a magnet built into the outer ring of the butt, causing a second magnet, inside the light, to switch the light on or off.

One of the most unique features of the Sea-Lite is that there are no cords or transformers needed to recharge it. Removing the butt cap exposes two stainless steel prongs. (Water gets inside the cap, around the prongs, but not inside the light.) Simply plug the Sea-Lite directly into a 110 volt wall socket and leave it there until charging is complete, about 36 hours. One nice safety feature is that leaving it charging more than 36 hours will not harm it.

The butt cap comes with a swivel-mounted wrist lanyard but the cap must be tightened properly to remain attached to the light. The bayonet lock becomes secure only when tightened by twisting the cap clockwise past the on position. This should be done with minimum force. The cap is removed by a counterclockwise twist past the off position.

Care of the Sea-Lite requires only that you wash it in fresh water (especially the prongs under the butt cap) after a day's diving and let it dry before recharging.

The Sea-Lite was marketed in Germany (under another name) for three years. El Mar Corp. now owns the rights to it and manufactures it exclusively. They will replace your light if any part of it should fail (even the bulb) during the first year after purchase. I would think that with reason-



SEA-LITE

Length.....5 inches
Weight.....4.6 ounces
Case material.....foamed polyurethane
Burn time.....40 minutes plus
Charge time (full).....36 hours

photos/Bonnie J. Cardone

able care, under normal sport diver usage, it should last much longer. For a look at this handy little light, see your Sea-Lite dealer or contact El Mar Corporation, 821 Artesia Blvd., Carson, California 90746.

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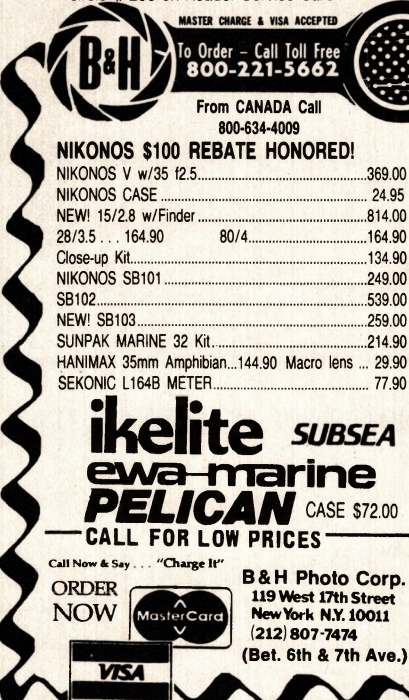
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HAWAII DIVER RESCUE SEMINAR

On July 6 the Honolulu City and County Department of Parks and Recreation, the University of Hawaii School of Medicine Hyperbaric Treatment Facility and NAUI West Pacific will sponsor an all day diver rescue seminar and workshop for both the diver and non-diving friend or spouse. In addition, there will be displays and presentations by the ambulance services and the Honolulu Fire Department on their role and capabilities in diver rescue. The course will be held from 8:00 am to 4:30 pm at McCoy Pavilion and Ala Moana Beach Park.

The minimal fee of \$15 will cover attendees' handouts and refreshments and will also be used for a contribution to the operation of the hyperbaric treatment facility. Send your check or money order for \$15, payable to Oahu Diver Rescue Seminar, to 1726 Piikea Street, Honolulu, HI 96818.

U/W HOCKEY CHAMPIONSHIPS

The 1985 National Championships of U/W Hockey, sponsored by the Underwater Society of America, will be held in West Palm Beach, Florida on June 14-16. For information please contact: Tom Miller, Director, 1105 Helen, Deer Park, TX 77536; (713) 476-4043.

RICK'S IN ARKANSAS


Rick's Pro Dive 'n Ski Shop, Inc., a PA-DI Five Star Training Facility that opened in April 1978, is relocating and expanding operations in North Little Rock, Arkansas. The new 6,500 square foot facility, at 24th and Poplar Streets, will feature a 14 foot deep heated indoor training pool and two classrooms, in addition to the show-room, full service repair area, rental room and offices. The new facility will also provide both men's and women's dressing rooms, showers and lockers, for the convenience of the students. Outside the pool, decking with tables and chairs and a barbeque pit will provide a break and refreshment area.

The new address is: 24th and Poplar Streets, N. Little Rock, AR 72114; phone: (501) 753-6004.

DAN/UNITED WAY


Some federal, state and local government employees are now designating all or part of their payroll-deducted United Way contributions to DAN. Employees from private businesses have contributed to DAN in the same fashion.

DAN is a national human health and welfare charity. It is legally connected to Duke University Medical Center, which is recognized as tax exempt by the IRS under 26 U.S.C. 501 (c)(3). DAN members participating in United Way contributions

are urged to designate DAN as a beneficiary. Inquire with your employer or local United Way office as to how to do so. If you have already completed a pledge card you can, at any time, request to change your pledge card to include DAN. 


LCUDC MEMBERSHIP DRIVE

The Louisiana Council of Underwater Diving Clubs (LCUDC) is holding a membership drive. The organization sponsors a year-round spearfishing contest, keeps the official Louisiana spearfishing records, publishes a bi-monthly newsletter (free to members), keeps members informed on, and lobbies for or against, laws concerning diving in Louisiana and surrounding states. Membership in the LCUDC is open to all clubs in Louisiana and bordering states.

For more information contact LCUDC, 3513 43rd St., Metairie, LA; (504) 833-1884. 

HEUER DISTRIBUTOR

PB Sales of Honolulu, Hawaii has changed its name to Timeless Reflections, Inc. In addition to the new name, there is a new phone number: (808) 523-8105. In Honolulu, Timeless Reflections, Inc. is owned by John and Pat Schmidt. They have been selling Heuer watches since September of '82. They are veteran divers who are well acquainted with the Heuer line.


Timeless Reflections, Inc. is at 1249 South Beretania Street, Honolulu, HI 96814. 

JUPITER-TEQUESTA DIVE SHOP

Steve and Jeannie Harris have recently opened Subsea Aquatics. A full service dive shop, it is in Jupiter-Tequesta on the Intracoastal Waterway and U.S. Hwy. 1, one mile north of the Palm Beach-Martin County line.

Subsea Aquatics offers a number of courses, including a three day resort course through assistant instructor and a large variety of specialty courses. Subsea creates a club atmosphere with classrooms, instruction, a beach, showers and dressing area on premises as well as a dock with air service. The store rents, sells and repairs most of the major brands of diving equipment.

The Harrises run reef drifting and anchored diving trips to all the best locations in the area aboard the custom built 25 foot boat *Expectation*. The vessel offers freshwater rinse for equipment, a smooth, dry ride, full electronics and an easy entry and exit dive platform.

The Harrises, in association with Jupiter Bay Resort and Tennis Club, work with each individual or group to ensure that all accommodations are satisfactory. For more information, contact Subsea Aquatics, 17967 U.S. Hwy. 1, Jupiter, FL 33468. 

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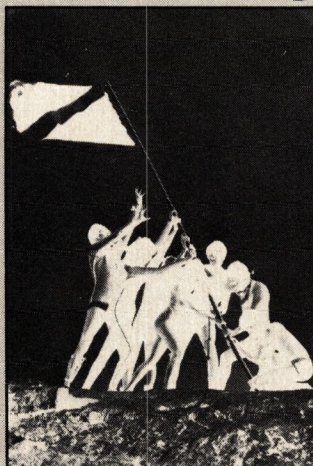
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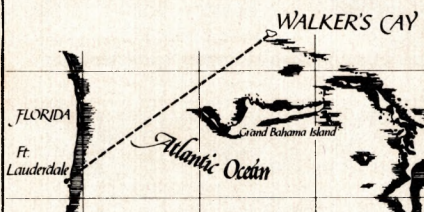


...You can't see the villas for the trees



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114 SKIN DIVER APRIL 1985

Robert L.
Straight

• HOUSTON •

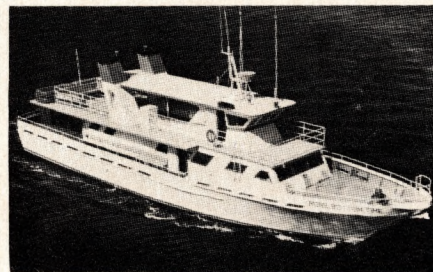


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MORE BOTTOM TIME

The 95 foot, live-aboard dive vessel, *More Bottom Time*, will be making cruises out of Freeport, Texas during July and August. Trips to the Flower Gardens and Stetson Bank include food, air fills, instructors and dive coordinators. These cruises will leave Freeport Friday night, make two or three dives during the day at



the Flower Gardens, make one night dive there and then move to Stetson for two Sunday morning dives. Trips are scheduled for July 4-5, 20-21; August 3-4 and 17-18.

The *More Bottom Time* will also make one day trips to the 572 foot sunken tanker, *V.A. Fogg*, July 11 and 25; August 8 and 22. These include lunch, instructors and dive coordinators.

The above dive cruises can be booked through the following Texas scuba stores: Houston Scuba Academy, Houston; Copelands Scuba School, Corpus Christi; Trident Divers, San Antonio; Gulf Safari, Freeport; and Skin Diving Schools of Fort Worth.

FREHSEE/HOLLAND TO FISHEYE

Fisheye Photo of Grand Cayman, the first NAUI sanctioned photo college in the world, will hold two advanced photo seminars in Grand Cayman. Dubbed Master Classes by Fisheye owner Martin J. Sutton, they have been designed with the advanced amateur in mind. Each seminar will last five complete days and include lecture sessions, in-water photo coaching sessions and critique periods.

Rick Frehsee will teach one course in June. Robert Holland will also teach a course in June, covering animal behaviour patterns, wildlife photo techniques and marine life classification.

HOLIDAY DIVERS

Capt. Bill's Holiday Divers of Key Largo, Florida is open and offering daily dive trips to the colorful reefs of Pennekamp Park. Two, six passenger dive boats, *Holiday Diver* and *Whatever It Takes*, leave at 8:30 and 1:00 pm from Marina 100 on U.S. 1 next to the Holiday Inn, Key Largo.

The dive boat captains are Bill Bradford and Bill Crawford. Bradford has been an avid wreck diver since 1968.

Crawford, previous owner of Tropic Isle Dive Shop and Staniel Cay Divers, is back in the Florida Keys diving and photographing his favorite sites.

Capt. Bill's Holiday Diver offers rental gear for customers along with a full service dive shop. PADI dive and photography classes are also offered, as well as the many specialty courses.

For full details and information call (305) 451-0815 or write Capt. Bill's Holiday Diver, 1 Bowen Dr., M.M. 104.5, Key Largo, FL 33037. >

NIKON REBATE

Nikon Inc. has a \$100 cash rebate offer available. The rebate will be offered when the Nikonos V and SB-103 Speedlight are bought together, through May 31.

The SB-103 Speedlight is a new, trim, compact and powerful electronic unit which includes automatic TTL flash me-



tering. The Nikonos V is the only underwater photographic system in the world which offers TTL.

To receive the rebate, the customer simply fills out and signs the rebate application and returns it, along with the end panels of the Nikon boxes that contain the serial numbers, a copy of the bill of sale and Part II of the warranty, to Nikon Inc., P.O. Box 506, Oceanside, NY 11572. The postmark should not be later than June 15, 1985.

Subject to verification, the rebate will be sent to the customer within six weeks after the application has been received. In addition, the owner will automatically become a member of the Nikon USA Club. As such, he/she will receive product offers through special mailings. >

HALL PHOTO CLASS

Howard Hall, author of *Successful Underwater Photography*, will offer classes in 35 mm underwater photography this year aboard the dive boat *Peace*, which operates out of Ventura Harbor, CA. The program includes three days diving California's Channel Islands, use of all photo equipment (except Nikonos camera) and onboard film processing. The cost is \$475. The first class begins May 17. For more information call Ron Palmer at (619) 292-0768. >

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STDC/LIMETREE

Last December the St. Thomas Diving Club opened its fifth dive center at the popular Limetree Beach Hotel on the south shore of St. Thomas. Now, diving guests staying at Limetree can experience the same convenience as those staying at other St. Thomas Diving Club center hotels.

Morning and afternoon boat diving will be available from Limetree and a complete line of rental equipment and a retail center will be on the premises. For non-divers, resort or full certification instruction will be offered at the Limetree pool.

The St. Thomas Diving Club in St. Thomas, U.S. Virgin Islands, has dive centers at Villa Olga, Bolongo Bay Beach and Tennis Club, Pt. Pleasant, the new Virgin Grand and Limetree Beach Hotel.

ARCILA/EXCURSIONES AKUMAL

Gonzalo Ivan Arcila is a new partner in Excursiones Akumal, the oldest dive shop in the Mexican Caribbean. Arcila, a native of Merida, Yucatan, has been director of diving operations since 1983.



He will continue to act in that capacity. A PADI instructor with five special ratings, Arcila, who is fluent in English and Spanish, has certified over 200 people since joining Excursiones Akumal in 1981.

Situated south of Cancun in Quintana Roo, where the Caribbean meets the Gulf of Mexico, Akumal, in the Mayan language, means The Place of the Turtle.

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(camera featured at right)



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(featured at right)



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U/W POKER GAME

Last August the first annual great Underwater Poker Showdown was held at Celebrity Sports Center in Denver, CO for the Muscular Dystrophy Association.

The event was organized by the Colorado Front Range Scuba Diving Centers. Eight individual dive stores got together for this fundraiser. They were A1 Diving Company, Denver Diver's Supply, Mile



photo/Jay Koelzer, Rocky Mountain News

High Divers, Rocky Mountain Diving Center, Scuba Den, High Country Divers, The Scuba Shoppe Ltd. and Weaver's Dive Center. Each dive store put together a six man team which featured one member of the Denver media. Each player started out with \$500 in phony chips. These were painted fender washers. The cards were standard playing cards laminated in plastic. Each participant played seven card stud for one hour, after which time the chips were added up and placed on a tote board. At the end of the day, some ten hours later, the dive store with the highest winnings received a traveling trophy. This year's winner was Mile High Divers with team captain Tom Kaiser.

After the poker game, an auction was held at a local restaurant with over \$5,000 worth of donated dive equipment auctioned, ranging from regulators to snorkels. Overall, the event was a huge success, with over \$6,000 raised to help fight the 40 neuromuscular diseases covered by MDA.

THOMPSON/CO

The College of Oceaneering has appointed Tommy Thompson manager of marketing and sales. Thompson, a diver since 1937, brings 28 years of military diving experience (including explosives, mine disposals, diving safety, repair and salvage) and 22 years of diving instruction to the position.

Included in Thompson's distinguished career was 11 years of work with Jacques Cousteau. Thompson served him as a liaison to the government and military, as well as a diver.

The College of Oceaneering is in the Los Angeles Harbor. It is an accredited community college.

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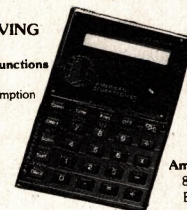
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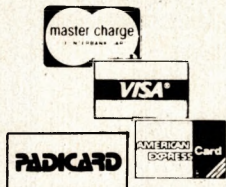
(Continued from Page 102)

intervals to see how it is holding up. If it is solid and sturdy but still has debris or encrustations on it put it back in. If not, take it out. Most small objects should be finished within two weeks.

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TECHNIFACTS

(Continued from Page 16)

reation; and fish and wildlife habitat.

Not all rivers and not all areas of any one river, are conducive to dam construction. Even if a river is dammable there are other considerations. The public preference to dam or not to dam, usually based on economic requirements vs. maintaining the natural environment, is one dictating factor. An evaluation of major physical changes of an area affected is another. But once a decision is reached that a dam will provide more benefits than harm and when construction starts, commercial divers such as Dave Darlow of Spokane, Washington, become an important part of its future.

I met Darlow during my 3,000 mile trek across Washington, Idaho and Oregon to inspect rivers and dams. In his 25 years as a commercial diver who specializes in dam jobs, he has worked on 46 different dams throughout the Northwestern United States. He told me, "The average depth of the dives I have made is about 100 feet. On one job I made 40 working dives using compressed air to a depth of 213 feet while working at an altitude of 5,000 feet."

Like many other commercial divers Darlow began his underwater adventures as a sport diver. Mostly he dove in the Spokane River area looking for artifacts of all kinds—stone and bone tools, pottery, wrecks and other objects. He dove under bridges, near piers, around pilings, on and inside wrecks. By 1960 he was a well qualified diver who worked as an aircraft mechanic. In his spare time, he started filling in as a tender and when diving was involved, as a diver.

One of the turning points in Darlow's life as a commercial diver occurred while he was working on the \$200 million Wells Dam on the Columbia River in Washington. During the later construction phases (1966 and 1967) 16 commercial divers were working. It was here Darlow met and worked with some of the Northwest's greatest old time divers—Johnny Daves, then 55 years old; Paul Greenae, 50; Warren Gordon, 52; and the venerable Spud O'Donnel, the granddaddy of the group at 70. It was these old timers who broke Darlow into the finer arts and crafts required to be a successful commercial dam diver.

In 1969 Darlow was working full time as a diver for Allied Commercial Divers, a company that had two diving rigs and employed two divers. Some of their work was in connection with dam jobs. They also did underwater pipeline inspections and repairs. When the owner died, Darlow ran the company for a few months, then arranged to purchase company and

equipment. Since then Darlow has expanded the amount of equipment available for his crews to five helmet rigs plus numerous scuba outfits for backup and for some of the lighter inspection work. Since a lot of his work is at high altitudes Darlow has his own recompression chamber and the necessary air compressors to provide emergency decompression or treatment at the job site.

As Darlow pointed out to me during our research through his notes and photographs, "Everything about a dam is big." As an example, in the Wells Dam, which is not particularly large there are ten generating units *each of which* has a 42 inch diameter shaft weighing 77 tons connecting the 225 ton turbines to the rotors that weigh another 431 tons. Each massive generating system, weighing a total of 733 tons, turns at only 85.7 rpm. The ponderous spillway gates are in two sections; the upper section weighing 85.5 tons, the lower one 160 tons. This small dam is 4,460 feet long and rises 185 feet above bedrock. It is designed to allow a maximum of 1,180,000 cubic feet of water per second to flow through the spillway. This dam can generate a total of 820,000 kilowatts of electrical energy, enough to supply electricity to a city of nearly one million people.

Dave Darlow has worked on the McNary Dam, 180 feet high, 7,392 feet long, on the Columbia River between Oregon and Washington; Dworshak Dam, 693 feet high, 3,300 feet long, on the Clearwater River in Idaho; Hells Canyon Dam, 330 feet high, 1,000 feet long, on the Snake River, Idaho; and the Chief Joseph Dam, a 230 foot high, 4,300 foot long, concrete gravity dam on the Columbia River in Washington. All were interesting, challenging and rewarding projects. Many were at high altitude and all were potentially dangerous.

I asked Darlow what kind of work had to be done on the many dams. "During construction," he explained, "Most of the work involves the cofferdams; fitting, sealing the various sections of the sheet pilings and later cutting them off underwater. Sometimes we have to set small dynamite charges to blast rock outcroppings so the pilings can set properly. Also, to help keep the cofferdams watertight we sometimes have to pour concrete. In the later stages of construction we have to install sensors for water temperature; instruments to measure stress on the installation; and finally, remove bulkheads and stop logs on both the upstream and downstream sides of the dam." After another sip of coffee he added, "Another sometimes difficult job is working to set the trash racks on the upstream side of the dam." These heavy metal racks or grill-like strainers keep logs and other heavy trash from passing through the penstock and getting into the turbines, causing severe damage.

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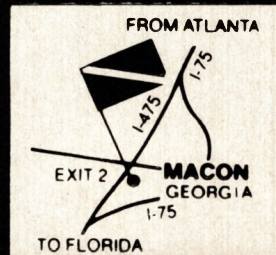
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TECHNIFACTS

dams? I asked. "What kind of jobs do you do then?"

"Usually only some of the total number of generators are installed in a dam when it is first commissioned," Darlow explained. "Other units are installed when the dam is completed or even later. A lot of construction debris finds its way into the generator wells, as well as silt, rocks and sometimes logs. We have to take all of this out and clean the units."

Darlow told me about work he had done on the Wells Dam. On this dam only six units were originally running. Five were not in service. "We had to inspect and repair part of the spillway basin. Mostly this involved placing sheet piling and then sealing the assembly so the cofferdams could be pumped out."

During the first two years or so divers are frequently required to perform remedial maintenance. "Valves need repairs or replacing, broken fittings have to be replaced, the heavy sluice gates stick and divers have to find out why and," he added, "hopefully, remedy the condition." On Dworshak Dam Darlow had to make repairs to the gates that are adjusted to control the temperature of the water from different levels of the lake.

Underwater cutting, welding; use of compressed air and hydraulic tools to drill and chip; use of all hand tools, rigging wire and rope slings and in general; just about everything that might be required of a construction crew topside must also be done by divers in the cold dark waters.

For the hazards of dam work Darlow prefers helmet equipment because of the good, reliable air supply and communication system. He currently uses three sets of Mark V helmet rigs and two Aquadyne outfits. With the necessary equipment including Unisuits; 40 to 50 pound weight-belts for the lightweight helmets; and 65 pound belts for the Mark V helmets; 300 feet of air hoses and telephone cables for each helmet; and three air compressors and volume tanks, he can tackle just about any job.

To permit rapid response to a call for a dam job (it seems almost all of these are of emergency nature) Dave Darlow has enough equipment installed on his huge semi-trailer to deploy a three diver team from Allied Commercial Divers shop (at North 8029 Division Street in Spokane, Washington) to any dam in the Northwest within one-half hour.

Worldwide, Darlow thinks there are about ten diver deaths per year in dam work. He feels that most of the deaths and accidents, too, can be attributed to inexperience and inadequate diver training. Divers get lost, tangled and occa-

sionally trapped in some part of the dam structure. Carelessness and overconfidence account for some of these.

At present there is no known mixed gas diving being done on dams. The average working depth for Darlow's jobs is about 80 to 100 feet (from a minimum of 5 feet to a maximum of 265 feet).

"One thing about my work is that no two jobs are the same," Darlow told me. "I've worked on and deep inside dozens of dams; in a flooded coal mine in Montana; for pipeline companies from Billings, Montana to Spokane, Washington; for the U.S. Navy, Air Force, Corps of Engineers, Bureau of Reclamation; for two railroad companies; for the Hanford Atomic Works and as a quality assurance marine consultant for eight different projects." In addition to all of those jobs, Dave has also been called on to recover over 30 sunken cars, five trucks, two aircraft, one helicopter, four boats and 47 bodies, some in the vehicles.

Darlow has had a busy life as a commercial diver. Perhaps more than most, because of the hazardous nature of dam diving, Dave knows that working underwater is not a forgiving job. A commercial diver is allowed no mistakes. Good equipment, well trained and qualified personnel, planning and coordination with topside crews can make a very difficult and dangerous job a thing that can be a successful venture. Dave Darlow, Allied Commercial Divers of Spokane, Washington, has all of these plus the determination to see that his dam jobs are completed in the best possible way.

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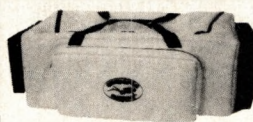


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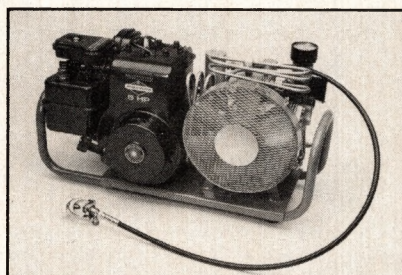
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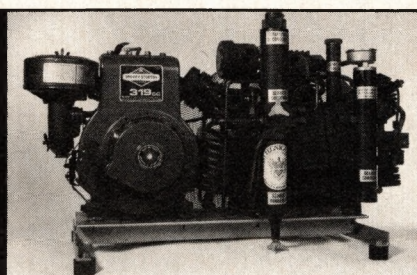


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Saga of The RATTLE SNAKE

BY HOWARD B. TOWER JR.

This drama began in April, 1861. The final act took place in the United States District Court at Savannah and has grave implications for divers in Georgia. Wreck divers across the nation must become active in the political process on federal and state levels to prevent the sorry situation in this state from repeating itself. Here is a sketch of events spanning 120 years.

The *Nashville* was a first class side-wheel steamer (with auxiliary sail) built in New York City in 1853. She displaced 1,220 tons, was 216 feet long and 34 feet wide. Owned by a northern shipping firm, the *Nashville* was at Charleston, SC when the Civil War broke out. The Confederate government seized the vessel and armed her with two small cannons. The ship's mission was to destroy Northern vessels.

On November 19, 1861 the *Nashville* captured and burned the Yankee clipper *Harvy Birch*. Pursued by Union warships she took refuge at Southampton, England, thus becoming the first ship to fly the Confederate flag in English and European waters. Southern sympathy was strong in England. Parliament reacted by passing a law forbidding Union vessels to pursue ships flying the Confederate flag in English waters.

In 1862 the *Nashville* became a southern legend—and an albatross for the Union Navy—by repeatedly running through the northern blockade in broad daylight. These successful efforts brought tons of arms and munitions for the Confederate war machine. Her mighty engines mocked Union attempts to close southern ports. Irate northerners called on President Lincoln to dismiss Gideon Wells, Secretary of the Navy.

Later that year the *Nashville* was purchased by private investors from the Confederate government for \$120,000. She was slipped up the Ogeechee River to a railroad crossing. There the protean ship was converted to a cruiser, armed with a 100 pound swivel deck gun and four additional cannons—24 and 32 pounders. She was rechristened the *Rattlesnake*. Her mission as a privateer would be to raid and plunder Union merchant ships and bring her owners great wealth from the sale of captured ships.

On her maiden voyage the *Rattlesnake* was supposed to transport 700 bales of cotton to England and sack Union vessels on its return. The cotton was worth a fortune because the South, a world supplier of this fiber, had ceased export.

However, fate had a different course set for the *Rattlesnake*. Easing down the

winding Ogeechee she grounded on a sandbar in Seven Mile Bend, just above Fort McAllister. Naval observers reported the vessel's position. The monitor *Montauk* and three gunboats steamed up the river and anchored below the fort. As the gunboats shelled Ft. McAllister, the *Montauk's* 11 and 15 inch guns blasted the *Rattlesnake*. On fire and abandoned by her crew, the ship exploded when flames reached her magazine.

The years passed. Worms, rot and the relentless tidal action of the Ogeechee slowly disintegrated the hull. Crabs and eels made their homes in the bowels of this historic war machine.

In 1958 a scuba diver (now deceased) located the *Rattlesnake's* remains and during the next two years he and his friends groped around the wreckage in the Ogeechee's murky water. Loose artifacts were recovered. In 1960 Georgia began to develop Ft. McAllister as a state park. State officials contacted the discoverer of the wreck and hired him and a Savannah construction company to raise pieces of the machinery and other artifacts for display. A large crane and barge were moored over the site. The ship was dynamited and portions of the rotating machinery were ripped from the wreck, dragged to the park and allowed to rust.

During the following years divers from Savannah visited the site, recovering cultural material. I read accounts of the *Rattlesnake's* destruction in 1973 while doing research at the Jacksonville, Florida public library. I shared my findings with two other divers experienced in low visibility conditions.

The *Rattlesnake* was not difficult to locate. Contemporary Civil War maps plot its position accurately. Its bones lie at an approximate 45 degree angle to the Ogeechee's western bank and are 125 feet from shore. The Ogeechee is a tidal river for many miles inland. The outgoing tide makes a large boil over the site and when the tide is extremely low, a huge iron "knuckle" breaks the water's surface. Exploratory diving revealed this is attached to a solid iron shaft, eight inches in diameter, that extends 18 feet up from the bowels of the wreck. A concrete public boat ramp at the state park allows a short one and one-half mile trip to the *Rattlesnake's* grave. The ship is easy to snag with an anchor.

My first dive was a thrill. Though blasted and burned the oak double hull still gave evidence of the vessel's first class construction. Frames and timbers are pinned together with brass spikes and copper dowel rods. Below the waterline the vessel's hull is sheathed in copper. The exposed timbers are worm ridden, weak and rotten.

Exploring the *Rattlesnake* is reminiscent of the story of the blind men feeling an elephant. My underwater light pierced the murky darkness a scant two feet. However, tons of coal and part of a boiler remain exposed. The rotating machinery

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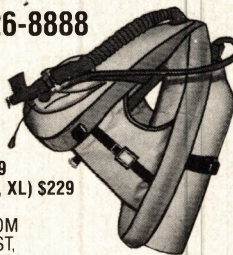
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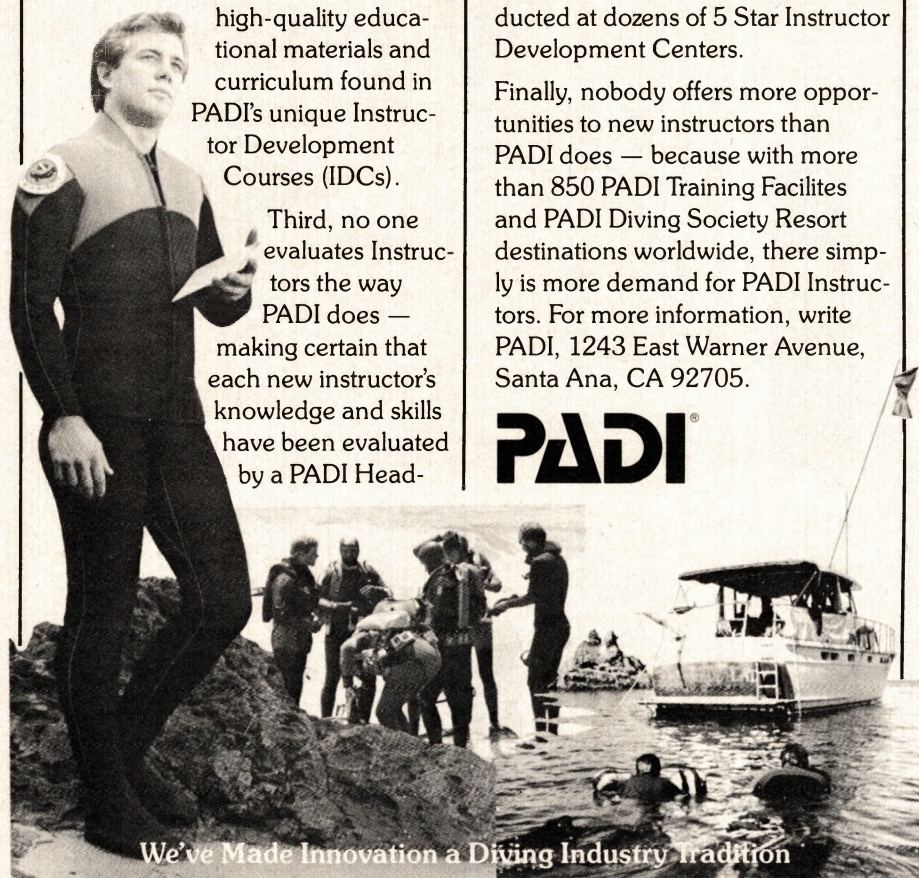
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RATTLESNAKE

and shafts of solid iron eight to ten inches in diameter form a gigantic forest. At low tide portions of the vessel are within four feet of the surface. Sand covering the interior of the vessel sealed in tons of supplies, military accouterments and weapons required to equip and sustain 120 men for months at sea.

The stern of the *Rattlesnake* was shattered when the powder magazine exploded. Seventy-five feet of hull is scattered over the limerock and marl bottom of the Ogeechee. Here the depth is 30 feet and sand from the bar is ever-shifting: Artifacts covered one day are exposed the next. This is where my companions and I made most of our discoveries including brass spikes, musket balls, 32 pound explosive projectiles and portholes. I found an iron fragment believed to be part of the 100 pounder rifled cannon which contemporary accounts state exploded prior to the magazine.

My companions and I visited the wreck several times during the mid 1970s. Little did I realize that one dive conducted June 8, 1974 would be the subject of testimony in federal court a decade later. On that day a Georgia Wildlife Officer visited us. We explained our intentions to recover relics from the *Rattlesnake*, which did not surprise the officer. After all, he had witnessed many divers at the site. However, one of our boats was not properly registered. My partner drove to nearby Savannah and registered his craft then returned to the site. Later that day the same officer visited us and observed the recovery of a large wrench and other material from the vessel.

Several diving instructors used the wreck for advanced classes and no one was ever prevented from diving or recovering cultural material by the ever-present wildlife officers. Many considered the idea of excavating the *Rattlesnake* but the expense of such an effort plus the adverse diving conditions brought an end to such thoughts.

Then in March 1979 two brothers, Frank and Paul Chance, still in their teens, along with David Topper, an experienced diver from South Carolina, undertook a serious excavation effort. They pooled their resources, built a barge with a motor and winch, constructed an airlift and assembled the necessary diving equipment. Next they conducted an archaeological reconnaissance of the site and mapped the remains of the vessel exposed in the bar.

Both the Chance brothers are amateur underwater archaeologists and educated themselves on archaeological procedures. Both are skilled machinists by trade, which enabled them to interpret the layout of the steam engine and how asso-

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ciated equipment functioned. By August 1983 they had conducted 88 dives on the vessel, excavating about 30 percent of the wreck site. During this time they made elaborate drawings of the ship's machinery and hull structures.

Using a fine mesh screen with their air-lift, the team recovered the smallest pieces of cultural material from the site, including pieces of the blasting caps used by the state to dynamite the wreck. The divers maintained a log of their activities and where they possessed the skill, preserved and stabilized objects from the vessel. Other items were stored in fresh water or in the river until proper preservation techniques could be applied—a standard archaeological procedure.

State officials were aware of their activities just as they had known of countless divers before them. Then during August 1983 these officials visited the Chances and threatened to prosecute them under a state antiquities law which declares everything submerged in state waters to be state property. However, a state archaeologist who reviewed their work was so impressed he attempted to obtain a permit to allow the excavation to continue. The state turned down their application and gave no reason for doing so. With all avenues of cooperation destroyed, the Chances and Topper filed suit in the Federal District Court claiming salvage rights under Admiralty Law.

I first met the Chances and Topper at a quarterly meeting of the Georgia Archaeological Task Force held at Macon, Georgia on October 7, 1983. I was invited to give a presentation outlining why professional archaeologists and divers should work together. Later that day the four of us discussed the *Rattlesnake* and the state's cold shoulder toward responsible divers. As southern regional chairman of the Atlantic Alliance for Maritime Heritage Conservation (a coalition of divers, salvors, archaeologists and conservationists interested in responsible exploration of submerged cultural resources), I realized these men deserved my full support and that of the Alliance.

During February 1984 I visited the Chances and reviewed their work, which consisted of a detailed log, drawings and hundreds of objects recovered from the vessel. I agreed to testify in their behalf and to ask archaeologists within the Alliance to offer any assistance necessary. It was no secret the state would make every effort to discredit their project.

I discussed affairs in Georgia with Charles McKinney, executive director and Duncan Mathewson, chairman and advised them that the Alliance should render any assistance possible for the Chances and Topper. Daniel Koski-Karell agreed to review their work and conduct a survey of the *Rattlesnake*. Dan holds a masters degree in archaeology and has extensive experience exploring sites in

(Continued on Page 131)

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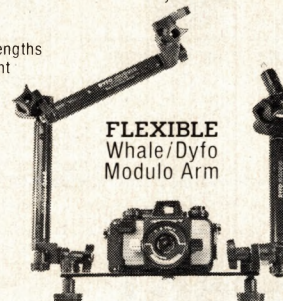


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BY HOWARD HAMILTON

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pockets. The right-hand Versapocket can be easily modified to function the same as the large, self-pleating pocket on the left. As with the redesigned pockets on SeaQuest's Sea Jacket V and Sea Vest II, they are easy to open, fill and close with a single, gloved hand—without even looking! Both pockets are unusually large, capable of swallowing a full size set of dive tables *sideways* with room to spare. The left-hand pocket also features a C-card holder and a snap-ring for securing keys or other accessories.

When you first don the ADV on land, you immediately notice how the weight of the tank is supported almost entirely by

by either holding up and depressing the oral inflator or pulling down on the inflation hose to activate the Rapid Exhaust valve. Complete deflation comes faster than you might expect, as most of the buoyancy chambers are underwater to start with.

Because the ADV's design keeps its center of buoyancy close to your center of gravity, maneuvering underwater with the ADV is easy. The design provides extremely low drag and allows you to vent the ADV completely while in a normal swimming position.


The ADV includes an integral SeaQuest quick release tank band and a



Left: The SeaQuest ADV allows unrestricted access to drysuit valves. Above: The pocket on the diver's right accommodates the octopus second stage and the left side hose retainer positions the gauge console where it can be reached easily.



new, balanced power inflator. Activating this requires only a very gentle touch and you can vary the rate of inflation by how far you depress the sealed, rubber covered button. The redesigned oral inflator is not only easy to use, it also minimizes the amount of water that will enter the vest accidentally.

The SeaQuest ADV is available in either a silver and navy blue combination or in an all black model with red trim. It comes in medium, large and extra large sizes to fit a wide variety of divers. The suggested retail is \$362.50 or \$375 with the optional CO₂ cartridge. See one at your local SeaQuest dealer. 

OCEAN PRO FIN

Hydrodynamic Profile Featured On Oceanic's New Flat Top Fin

TEXT AND PHOTOGRAPHY
BY ERIC HANAUER

In the scuba museum of the future, people will look at the display of old fins and express amazement these artifacts were once made of rubber. Plastic fins are the diving equipment revolution of the '80s. First introduced about five years ago, the new lightweight models have taken a lion's share of the market. Divers like them because they feel light, photograph well and seem to provide more power with less effort. Oceanic recently introduced its new version of this basic diver's tool, the Ocean Pro Fin. As company spokesman Peter Radsliiff explains, "We aren't always the first to come out with something, but when we do it, it's done right."

This handsome fin bears out his statement. Its wide foot pocket is flat and recessed; stiff blade ribs help support its contour. The blade is reverse vented to ease leg strain on the upstroke, while two supporting ribs near the center of the blade add stiffness. This results in a fin designed for power kicking.

As is the case with most plastic fins, the Ocean Pro's foot pocket is not rubber, but a plastic mixture with some rubber blended in. This is necessary for chemical bonding with the thermoplastic blade. However, early foot pockets of these materials displayed a tendency to sag and distort when exposed to heat, as in a car trunk or tropical sunlight. That couldn't be avoided, it is a characteristic of the material. Oceanic's solution is to provide mechanical support by recessing the main part of the foot pocket under the



The Ocean Pro fin has a wide foot pocket.

fin. That not only allows a flattened top to minimize sagging, but also provides a clean, hydrodynamic profile which spills water onto the blade on the downstroke. However, a stiff plastic "shoe tree" is still provided with each fin. The manufacturer recommends it be left inside for support when the fin is not being worn.

The Ocean Pro comes with a conventional heel strap or with the patented spring strap, first introduced several years ago on Oceanic's Fara Fin II. An extra cost option, this strap automatically

adjusts for all foot sizes and should not have to be replaced for the life of the fin.

The Ocean Pro is a fin that favors the power kicker; some effort is required to drive it through the water. Most of the power comes on the downstroke, but some is delivered on the upstroke as well. Used throughout a day of diving, the generous foot pocket felt good on my size 11 triple Es. It moved me efficiently on the surface and underwater, without undue fatigue.

Oceanic's corporate motto is "Diving essentials redefined." The new fin demonstrates taking a good idea and developing something better. The Ocean Pro costs \$62 with the spring heel strap and \$54 with a conventional strap. For further information contact Oceanic, 14275 Catalina Street, San Leandro, CA 94577.

OCEAN PRO FIN

Length.....	22 1/4"
Width.....	9" at the blade tip
Height.....	4"
Weight.....	2 lbs., 2 1/2 ounces
Sizes.....	Medium fits 6 to 8 1/2, Large fits 8 1/2 to 12
Materials.....	EVA thermoplastic blade, Thermoplastic rubber elastomer foot pocket

RATTLESNAKE

(Continued from Page 127)

low visibility water. He is a working archaeologist and secretary-treasurer of the Alliance. He was impressed by the effort and dedication these divers displayed in their excavation.

The trial took place August 6-7, 1984 at the Federal Courthouse in Savannah. Among the more interesting testimony presented was a detailed account of the state's indiscriminate blasting of the ship in order to obtain pieces of machinery to display at Ft. McAllister—using the taxpayer's dollars to destroy countless objects of cultural material in the process. Efforts to portray these divers as mercenary individuals backfired when it was shown that state parks sell antiquities, recovered from state land, to the public.

State archaeologists attempted to pick apart the salvors' archaeological techniques but their arguments were refuted by Dan Koski-Karell and this writer. The Antiquities Law used to halt the excavation was inacted during 1969 but was never communicated to the diving community. Few law enforcement officers know it exists and as mentioned, divers have been allowed to recover antiquities from the *Rattlesnake* for decades.

On August 17 the judge rendered his decision—what a shock. He ruled the *Rattlesnake* was state property and that it was not in peril from marine elements. He accepted the state's contention that the site was safe and secure for the next 100-150 years. The salvors, fighting against their own tax dollars, had lost. Will they appeal? That is a personal decision which they alone must make.

But what about the rest of us, diver and non-diver alike? There are lessons for us all. First, divers within Georgia must work through the political process to change a poorly written law. Believe me, certain state officials wish to forbid all diving in state waters and seek to strengthen the existing law to require permits for *exploration* of submerged bottom lands. This will strangle sport diving within the state. Getting mad won't help, constructive political action will. Discuss the situation with your friends (diver and non-diver alike). Less than a dozen individuals within state institutions support the present law. A grass roots effort channeled through state representatives from every district will have a dramatic effect in the legislature. South Carolina has a model program working today between the state and the diving community. You may obtain a copy of their law by contacting: Institute of Archaeology and Anthropology, University of South Carolina, Columbia, SC 29208. Study it and form a plan of action before your right to dive is obliterated.

Divers in other states should examine

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current laws affecting diving or the recovery of submerged archaeological resources. Just because you are unaware of such regulations doesn't mean they don't exist. Many of these laws were passed very quietly during the 1960s.

Lastly, divers must work to stop poorly written federal legislation from becoming law. The Atlantic Alliance has successfully fought this legislation in the past but needs your help. Persons interested in

joining the Alliance should write to: Atlantic Alliance for Maritime Heritage Conservation, P.O. Box 27272, Central Station, Washington, D.C. 20005.

No single article can present all aspects of a case so complex as the *Rattlesnake* yet the issues affect everyone interested in our nation's history. Persons concerned about this matter may contact Frank and Paul Chance, P.O. Box 483, Richmond Hill, Georgia 31324.

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Box 13M, MM 102.5, Key Largo, FL 33037	800/432-2871
The only dive shop located directly in Pennekamp. Free brochure, send 50c for reef chart.	
QUIESCENCE DIVING SERVICES, INC.	305/451-2440
P.O. Box N-13, Key Largo, FL 33037 MM. 103.5	
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ROCK REEF RESORT	305/852-2401
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SCUBA KEY WEST-CAPT BILLY	305/294-0660
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Dive the Sambos, Ten Fathom Ledge, WW II wrecks, USS Wilkes Barre. Every dive an adventure.	
SEA DWELLERS SPORTS CENTER	305/451-3640
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STEVE KLEM U/W GUIDE SERVICE	305/451-1831
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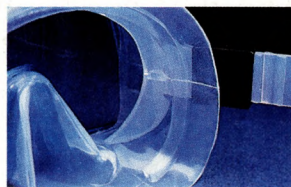
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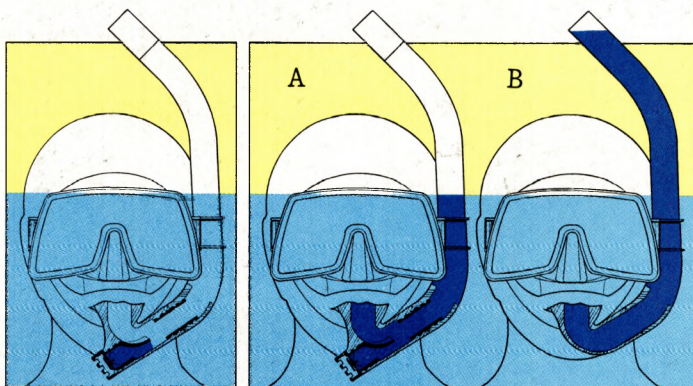
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